DOCKET SECTION

BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

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POSTAL RATE AND FEE CHANGES, 1997

Docket No. R97-1

RESPONSES OF THE UNITED STATES POSTAL SERVICE TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7 ITEMS 1-20 (December 9, 1997)

The United States Postal Service hereby provides its responses to the above items of Presiding Officer's Information Request No. 7, issued November 25, 1997. The questions are stated vertaim and are followed by the answer, with declarations from the witnesses.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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December 9, 1997

Response of United States Postal Service Witness Bradley
to
Presiding Officer's Information Request #7

1. In his oral testimony, in response to questions from the bench, witness Bradley stated that he would like to examine "each of the individual mail processing sites to see how volume and hours are related, once other factors are controlled for." Tr. 11/5582. Witness Bradley indicated that he had not done so. Tr. 11/5584.

a. For the cost pools listed in Table 7 of USPS-T-14, please provide the facility-level variabilities that would be obtained with the model given on page 36 of USPS-T-14. Specifically, estimate this model, including the serial correlation correction, for each facility separately, using only the time series data on that facility. This will yield a *unique variability estimate for each facility from the time series variation of the* dependent variables and regressors. Please report these results in a table containing the facility specific variability, its standard deviation, and the sample average over time of $\ln(TPH_{it})$ for that facility.

b. Please note the range of facility specific variabilities obtained in "a." for each cost pool and discuss whether it supports the assumption that a single cost pool variability can be validly estimated for the MODS facilities as a whole.

c. Please test the hypothesis that, for each cost pool, all of the facility-level variabilities obtained in "a." are equal versus the unrestricted alternative that the true facility-level variabilities "are statistically significantly different from one another." Tr. 11/5586 at lines 11-12.

d. Please discuss whether the results obtained from "c" support the assumption that a single cost pool variability can be validly estimated for the MODS facilities as a whole.

1. Response:

a. This question requests site-specific variabilities and describes one procedure for generating them, a procedure which implies a daunting task. Specifically, the suggested procedure requires the estimation and interpretation of 2,369 regressions, each corrected for serial correlation. While the estimation of the regressions can be done by a computer, the review and interpretation of them

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cannot. The proposed procedure envisions reviewing each estimated equation for statistical reliability, obtaining the estimated variability from each equation, calculating its standard deviation, collecting all such variabilities in a table, and combining this information with the mean ln(TPH) for the relevant site. If this procedure takes only 5 minutes per regression, it would require no less than 11,845 minutes, which is approximately 197 hours or 24.67 workdays. If this procedure ended up taking 10 minutes per regression, the time requirement would double to nearly 50 workdays.[1]

Despite the magnitude of the task involved, I began the procedure with the Bar Code Sorting (BCS) cost pool. Recall that the estimated variability for this activity from Table 7 of my testimony is 94.5%, and that the TPH for this activity are generated by machine counts. I then began the procedure of estimating the 287 individual regressions as specified in the question. Attachment 1 to this response shows the econometric output for the first 8 of the regressions, which I reviewed. Examination of that attachment shows immediately that the proposed procedure for estimating site-specific variabilities will not work, because of multicollinearity in the

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[1] A review of ten minutes per regression equation seems quite brief. Econometric equations that are presented before the Commission are typically reviewed for hours, not minutes.

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data at the site level. In the case of the first site, IDNUM 9810, there is not a single statistically significant estimated coefficient, despite the fact that the R^2 is over 94%. In addition, the estimated coefficient on TPH has an implausible negative coefficient. As described by Greene, these are the classic symptoms of multicollinearity:

> **9.2.3.** The Symptoms of Multicollinearity
> When the regressors are highly correlated, we often observe the following problems:
>
> 1. Small changes in the data can produce wide swings in the parameter estimates.
>
> 2. Coefficients may have very high standard errors and low significance levels in spite of the fact that they are jointly highly significant and the R^2 in the regression is quite high.
>
> 3. Coefficients will have the wrong sign or implausible magnitude.[2]

This last characteristic of multicollinearity is particularly noteworthy because it means that use of site-specific data to generate site-specific variabilities will lead to variabilities of the wrong sign or implausible magnitude. For example,

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[2] <u>See</u> William H. Greene, <u>Econometric Analysis</u>, Macmillan, New York, 1993 at 267.

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multicollinearity would explain the site-specific variabilities for the manual letter and flat activities with the wrong signs and implausible magnitudes cited by the Presiding Officer in his questioning of me. Tr. 11/5584.[3] Finally, the procedure proposed in this question for calculating site-specific variabilities does not work, even if mechanically applied, because the estimated coefficients for TPH are unreliable.[4]

Remember that multicollinearity is a data problem, not a specification problem. It is not caused by any infirmities in the model or the panel data, *per se*, but rather by the severe reduction in data set size when one goes from the large panel data set to the quite small site-specific data sets. In particular, it has been noted in the econometrics literature that a single time series of data may not have sufficient variation to estimate flexible functional forms like the translog. The prescribed remedy for this problem — indeed, the remedy I employ in USPS-T-14 — is to employ panel data. A panel data set:

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[3] The sources or methods of calculation of the variability numbers used by the Presiding Officer were not discussed.

[4] Please note that the sum of the TPH and lagged TPH coefficients from these equations is not the estimated variability. Because these are site-specific equations, they are not globally mean centered and the variability would have to be calculated by inserting the site-specific means for hours and TPH.

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> [G]ives the researcher a large number of data points, increasing the degrees of freedom and reducing the collinearity among explanatory variables — hence improving the efficiency of econometric estimates. (Emphasis added)[5]

Fortunately, despite the intractability of the proposed approach, there is a method available for calculating the site-specific variabilities requested by the Presiding Officer. A feature of my analysis in USPS-T-14 is that the variabilities are not constrained to be equal for all sites. The translog function form cannot provide a second order approximation to a general cost function while restricting, *a priori*, the site-specific variabilities to be equal.

Moreover, one should understand that in estimating the cost equations with mean-centered data and presenting a single variability estimate for each cost pool, one does not impose any such constraint. Mean-centering the data simply implements the widely adopted procedure for calculating the system variability, which is equivalent to the variability formula being evaluated at the sample means of the right-hand-side variables. However, the model given on page 36 of USPS-T-14 can be used to estimate site-specific variabilities as follows: A non-mean centered version of the equation is used to evaluate the elasticity formula given by::

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5 See, Cheng Hsiao, Analysis of Panel Data, Cambridge University Press, Cambridge, 1986, at 1-2.

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$\partial \ln(HRS) / \partial \ln(TPH)$. In the case of the model given on page 36, the explicit form of this formula is:

$$\hat{\varepsilon}_i = (\hat{\delta}_1 + \hat{\delta}_2) + (\hat{\delta}_3 + \hat{\delta}_4) \ln \overline{TPH}_i + \hat{\delta}_{11} \ln \overline{MANR}_i + \hat{\delta}_{12} \overline{TIME1}_i + \hat{\delta}_{13} \overline{TIME2}_i$$

The 2,369 site-specific variabilities, along with their standard errors and associated mean ln(TPH) are presented in Attachment 2. Please keep in mind that the fact that one can produce them does imply that these site-specific variabilities are important or even meaningful, because the variability analysis applies to the aggregate cost pool. One can, of course, find the average of the site-specific variabilities and the averages are presented in Attachment 3. Even though this averaging of the site-specific variabilities produces results quite close to those presented in USPS-T-14, and thus serves as a verification of those results, I do not recommend it. In fact, I agree with the Commission that such a disaggregated approach is fraught with difficulty and should not be used:

> When an econometric analyst estimates functional forms which provide variabilities as functions of output, like the quadratic, Higinbotham, and translog models, he is faced with the decision of selecting a level of output at which the variability will be evaluated. For his model, witness Higinbotham computed the "overall variability" as a cost-weighted average

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> of the variabilities estimated at all sample values of output. Witness Lion, on the other hand, computed the variabilities for the five models at the sample mean value of output. We accept Witness Lion's method for several reasons. In the first place, the sample mean is an estimate of the population mean and reflects the central tendency of data. Its significance can be measured statistically. Additionally, under normal conditions, cost functions behave better around the mean values.
>
> Moreover, it is standard practice in econometric cost studies of transportation industries to report elasticities at the sample mean, particularly when the translog cost function is used.
>
> However, witness Higinbotham's weighted average variability has no such antecedent in the econometric literature. Finally, deviating from the standard practice by moving to a weighting scheme introduces ambiguity as to the final result. For example, witness Higinbotham has weighted variabilities by the cost of each contract, although other reasonable weighting schemes could also be chosen which would yield a different result. Thus, choosing a weighted variability in lieu of the standard sample mean introduces an arbitrary element, which one could manipulate according to the desired result.[6]

b. The ranges of the site-specific variabilities are provided in Attachment 3. It is obvious that the calculated site-specific variabilities are not identical, but to interpret this finding, one must keep in mind that the fact that site-specific variabilities are not identical does not bear on the appropriateness of specifying a single variability for each MODS cost pool. Recall that the aim of the analysis is to estimate the <u>system</u>

6 <u>See</u>, PRC Op., R87-1, App. J, CS XIV, at 26-27

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response to small sustained changes in the volume of mail. Thus, a single variability is ultimately required. Nevertheless, a review of the site-specific variabilities validates the estimated equations presented in USPS-T-14, in that the range of site-specific variabilities is quite small relative to the variation in the sizes of activities. For example, there is tremendous variation in the sizes (as measured by TPH) of the manual letter activities. The smallest averages 652 thousand TPH per accounting period and the largest averages 52.633 million TPH per accounting period. This means that the largest site is 8,000 percent larger than the smallest site. Nevertheless, the range in the site-specific variabilities is a few percentage points. Attachment 4 presents the frequency distribution for the site-specific variabilities for the manual letter activity. This shows that the site-specific variabilities are closely clustered around 80%.

If the econometric results were fragile, one would expect to find many sites with economically meaningless variabilities, such as negative variabilities or variabilities greatly in excess of 100 percent. Of the 2,369 site-specific variabilities, only one is negative and none exceed 116 percent. This indicates that the econometric equations are very robust. In addition, the site-specific variabilities strongly reject the old assumption that the volume variability of mail processing labor is 100 percent. Of the 2,369 site-specific variabilities, only 11 of them are 100 percent or

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greater. Moreover, the variabilities of 100 percent or more are in only two activities and there are no variabilities of 100 percent or more for the manual letter, manual flat, OCR, LSM, BCS, FSM or SPBS activities.

Finally it is important to recognize that the use of single variability for a cost pool does not require the assumption that the evaluated variability at each site is the same. One does not have to assume that the variabilities are identical across sites as the old 100 percent methodology implicitly did. Rather, one can directly estimate the system response to a small sustained increase or decrease in volume. For the four important reasons given at Tr. 11/5494-5496, the best way to calculate the system response is with a single fixed effects equation.

c. The transcript cite does not relate to assumptions about equality of variabilities. Rather, it relates to hypothesis tests on specific estimated coefficients.:

> One could use the Chow test to estimate whether or not individual betas estimated for facilities are significantly different from one another. Tr. 11/5586.

The "betas" referred to in the quotation are estimated parameters, not variabilities. As shown in my answer to part a, the individual site-specific betas cannot be reliably estimated, so that in this particular case, the Chow-type test is not relevant.

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Nevertheless, the results provided in parts a. and b. above indicate that the calculated site-specific variabilities are not identical.

d. The results support two things. First, they show that the single, system-wide variabilities presented in USPS-T-14 are accurate and appropriate for calculating volume variable costs for each of the MODS cost pools. It is thus appropriate to have a single system variability for each MODS cost pool. Second, the results show that at both the system level and the site level, variabilities are less than 100 percent and are different across MODS cost pools. The results thus show that it is not appropriate to assume a single facility-wide variability of 100 percent across MODS cost pools.

1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9810

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	0.393086	DFE	48
MSE	0.008189	Root MSE	0.090495
SBC	-63.1597	AIC	-128.42
Reg Rsq	0.9433	Total Rsq	0.9433
Durbin-Watson	1.9693		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	40.4909726	37.741	1.073	0.2887
TPH	1	-6.5724156	7.358	-0.893	0.3762
TPH2	1	0.3471515	0.403	0.862	0.3929
MANR	1	4.5197177	3.683	1.227	0.2258
MANR2	1	0.3039696	0.248	1.224	0.2271
MANRTPH	1	-0.3635325	0.389	-0.934	0.3548
TIM1TPH	1	0.0075584174	0.007954	0.950	0.3467
TIM1MANR	1	0.0051470797	0.007619	0.676	0.5026
TIME1	1	-0.0602675	0.082	-0.734	0.4667
TIME12	1	-2.231733E-6	0.000124	-0.018	0.9857
TIM2TPH	1	-0.001301515	0.016	-0.084	0.9338
TIM2MANR	1	0.0108146	0.00742	1.457	0.1515
TIME2	1	0.0291528	0.138	0.211	0.8339
TIME22	1	0.0001670871	0.000158	1.056	0.2961
AP02	1	0.003105254	0.064	0.049	0.9615
AP03	1	0.0166350	0.062	0.267	0.7909
AP04	1	0.0888913	0.067	1.334	0.1887
AP05	1	-0.0567243	0.057	-0.988	0.3282
AP06	1	-0.00498033	0.066	-0.076	0.9399
AP07	1	-0.0506790	0.059	-0.864	0.3916
AP08	1	-0.0357874	0.062	-0.577	0.5669
AP09	1	-0.0164458	0.063	-0.263	0.7937
AP10	1	0.0071099329	0.065	0.110	0.9131
AP11	1	-0.0122527	0.063	-0.196	0.8455
AP12	1	-0.0399308	0.061	-0.653	0.5171
AP13	1	0.0119549	0.064	0.188	0.8518
TPH1	1	-0.2684220	3.291	-0.082	0.9353
TPH21	1	0.0141431	0.177	0.080	0.9367

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1
0	0.005172	1.000000	| |********************|
1	2.703E-6	0.000523	| | |

1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9810

Preliminary MSE = 0.005172

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.00052265	0.14586497	-0.003583

Yule-Walker Estimates

SSE	0.393086	DFE	47
MSE	0.008364	Root MSE	0.091452
SBC	-58.829	AIC	-126.42
Reg Rsq	0.9432	Total Rsq	0.9433
Durbin-Watson	1.9699		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	40.4479132	38.140	1.061	0.2943
TPH	1	-6.5630553	7.435	-0.883	0.3819
TPH2	1	0.3466629	0.407	0.852	0.3985
MANR	1	4.5199125	3.722	1.214	0.2307
MANR2	1	0.3038884	0.251	1.211	0.2321
MANRTPH	1	-0.3635783	0.393	-0.925	0.3599
TIM1TPH	1	0.007549576	0.008038	0.939	0.3524
TIM1MANR	1	0.0051471651	0.0077	0.668	0.5071
TIME1	1	-0.0601756	0.083	-0.725	0.4721
TIME12	1	-2.368027E-6	0.000125	-0.019	0.9850
TIM2TPH	1	-0.001304223	0.016	-0.083	0.9343
TIM2MANR	1	0.0108155	0.0075	1.442	0.1559
TIME2	1	0.0291741	0.140	0.209	0.8355
TIME22	1	0.0001672281	0.00016	1.046	0.3009
AP02	1	0.0030769595	0.065	0.048	0.9622
AP03	1	0.0166228	0.063	0.264	0.7932
AP04	1	0.0888993	0.067	1.320	0.1934
AP05	1	-0.0567133	0.058	-0.977	0.3334
AP06	1	-0.005009455	0.066	-0.075	0.9402
AP07	1	-0.0507021	0.059	-0.856	0.3965
AP08	1	-0.0358179	0.063	-0.571	0.5707
AP09	1	-0.0164633	0.063	-0.260	0.7956
AP10	1	0.0071032388	0.065	0.108	0.9141
AP11	1	-0.0122385	0.063	-0.194	0.8473
AP12	1	-0.0399400	0.062	-0.646	0.5215
AP13	1	0.0119407	0.064	0.186	0.8535
TPH1	1	-0.2689451	3.326	-0.081	0.9359
TPH21	1	0.0141773	0.179	0.079	0.9372

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1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9865

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	0.967052	DFE	48
MSE	0.020147	Root MSE	0.14194
SBC	5.257245	AIC	-60.0033
Reg Rsq	0.8749	Total Rsq	0.8749
Durbin-Watson	0.5797		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	127.771581	94.172	1.357	0.1812
TPH	1	-44.793773	26.611	-1.683	0.0988
TPH2	1	2.890522	1.644	1.758	0.0852
MANR	1	-27.124284	16.001	-1.695	0.0965
MANR2	1	1.709291	0.770	2.219	0.0313
MANRTPH	1	3.622167	1.878	1.929	0.0597
TIM1TPH	1	0.0100664076	0.017	0.590	0.5582
TIM1MANR	1	-0.012547181	0.011	-1.146	0.2576
TIME1	1	-0.087820903	0.142	-0.619	0.5386
TIME12	1	-0.000340741	0.000653	-0.521	0.6044
TIM2TPH	1	-0.064934526	0.048	-1.359	0.1804
TIM2MANR	1	-0.039550438	0.023	-1.738	0.0886
TIME2	1	0.479616	0.411	1.167	0.2490
TIME22	1	0.0009096136	0.000262	3.471	0.0011
AP02	1	0.142474	0.097	1.464	0.1496
AP03	1	0.0949478294	0.102	0.935	0.3546
AP04	1	0.124360	0.143	0.871	0.3879
AP05	1	0.0058107519	0.102	0.057	0.9550
AP06	1	0.144333	0.122	1.182	0.2432
AP07	1	0.160105	0.098	1.628	0.1101
AP08	1	0.0569359548	0.095	0.602	0.5498
AP09	1	0.124268	0.105	1.184	0.2421
AP10	1	0.0632973463	0.102	0.618	0.5396
AP11	1	0.0562915012	0.103	0.545	0.5882
AP12	1	0.0632373304	0.094	0.670	0.5058
AP13	1	0.0831418143	0.101	0.827	0.4124
TPH1	1	12.123678	5.822	2.082	0.0427
TPH21	1	-0.696934	0.344	-2.026	0.0483

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1
0	0.012724	1.000000	| |******************** |
1	0.009023	0.709109	| |************** |

1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9865

Preliminary MSE = 0.006326

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.70910881	0.10284927	-6.894641

Yule-Walker Estimates

SSE	0.367294	DFE	47
MSE	0.007815	Root MSE	0.088401
SBC	-63.2881	AIC	-130.879
Reg Rsq	0.8027	Total Rsq	0.9525
Durbin-Watson	1.2715		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	27.7340098	58.970	0.470	0.6403
TPH	1	-13.6734862	16.432	-0.832	0.4096
TPH2	1	0.8910473	1.021	0.873	0.3871
MANR	1	-5.6991082	10.266	-0.555	0.5814
MANR2	1	0.4428895	0.573	0.773	0.4436
MANRTPH	1	0.7916888	1.198	0.661	0.5120
TIM1TPH	1	0.0082523136	0.010	0.791	0.4328
TIM1MANR	1	-0.0101270	0.009655	-1.049	0.2996
TIME1	1	-0.0803421	0.090	-0.891	0.3777
TIME12	1	-0.000113571	0.00039	-0.291	0.7722
TIM2TPH	1	-0.0181019	0.035	-0.516	0.6083
TIM2MANR	1	-0.006758548	0.017	-0.406	0.6868
TIME2	1	0.1130421	0.300	0.376	0.7083
TIME22	1	0.0005998311	0.000251	2.390	0.0209
AP02	1	0.1034162	0.049	2.113	0.0399
AP03	1	0.0827386	0.065	1.280	0.2069
AP04	1	0.1260989	0.095	1.323	0.1921
AP05	1	0.0378241	0.075	0.502	0.6179
AP06	1	0.0895483	0.088	1.022	0.3121
AP07	1	0.1215048	0.074	1.652	0.1052
AP08	1	0.0300629	0.072	0.415	0.6802
AP09	1	0.0572912	0.075	0.764	0.4488
AP10	1	0.0153629	0.071	0.215	0.8306
AP11	1	0.0526565	0.071	0.747	0.4589
AP12	1	0.0321059	0.059	0.542	0.5904
AP13	1	0.0359168	0.052	0.685	0.4965
TPH1	1	7.0609646	3.738	1.889	0.0651
TPH21	1	-0.3973671	0.221	-1.796	0.0790

1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9875

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	0.201262	DFE	32
MSE	0.006289	Root MSE	0.079306
SBC	-56.9352	AIC	-115.577
Reg Rsq	0.9682	Total Rsq	0.9682
Durbin-Watson	1.2593		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-22.2326632	33.890	-0.656	0.5165
TPH	1	3.5802087	4.831	0.741	0.4641
TPH2	1	0.1650637	0.148	1.115	0.2733
MANR	1	-12.3265551	10.007	-1.232	0.2270
MANR2	1	1.3277367	0.576	2.303	0.0279
MANRTPH	1	2.2113789	1.381	1.601	0.1191
TIM1TPH	1	0.0048569378	0.010	0.464	0.6457
TIM1MANR	1	0.0057691077	0.013	0.448	0.6568
TIME1	1	-0.0818331	0.082	-0.999	0.3253
TIME12	1	0.000822623	0.000562	1.465	0.1528
TIM2TPH	1	-0.0288005	0.016	-1.757	0.0884
TIM2MANR	1	-0.0622449	0.023	-2.743	0.0099
TIME2	1	0.0801388	0.144	0.557	0.5816
TIME22	1	0.0005712038	0.000316	1.806	0.0803
AP02	1	0.0551049	0.062	0.893	0.3786
AP03	1	0.0706135	0.065	1.088	0.2846
AP04	1	-0.0460687	0.064	-0.720	0.4768
AP05	1	0.0607798	0.061	1.002	0.3240
AP06	1	0.0654331	0.067	0.980	0.3344
AP07	1	0.0224568	0.059	0.381	0.7057
AP08	1	0.0214662	0.061	0.354	0.7254
AP09	1	0.0120168	0.059	0.204	0.8397
AP10	1	-0.0241495	0.066	-0.368	0.7154
AP11	1	0.0312236	0.064	0.489	0.6279
AP12	1	0.0185759	0.064	0.290	0.7738
AP13	1	0.0207348	0.063	0.327	0.7459
TPH1	1	-1.2838149	1.402	-0.915	0.3668
TPH21	1	0.0782675	0.086	0.911	0.3690

Estimates of Autocorrelations

```
Lag Covariance  Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1

 0   0.003354    1.000000 |                    |********************|
 1   0.001208    0.360183 |                    |*******             |
```

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9875

Preliminary MSE = 0.002919

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.36018306	0.16755049	-2.149699

Yule-Walker Estimates

SSE	0.162286	DFE	31
MSE	0.005235	Root MSE	0.072354
SBC	-65.6166	AIC	-126.353
Reg Rsq	0.9632	Total Rsq	0.9744
Durbin-Watson	1.7630		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-7.62507672	28.956	-0.263	0.7940
TPH	1	1.15568812	4.013	0.288	0.7753
TPH2	1	0.17978277	0.119	1.512	0.1407
MANR	1	-5.48481193	8.783	-0.624	0.5369
MANR2	1	1.05836823	0.499	2.121	0.0420
MANRTPH	1	1.26888184	1.210	1.049	0.3024
TIM1TPH	1	0.000880393	0.008947	0.098	0.9222
TIM1MANR	1	0.00448302	0.012	0.380	0.7065
TIME1	1	-0.05634090	0.071	-0.789	0.4361
TIME12	1	0.0009114127	0.000508	1.794	0.0826
TIM2TPH	1	-0.02571857	0.014	-1.814	0.0793
TIM2MANR	1	-0.04230149	0.021	-1.988	0.0557
TIME2	1	0.09826784	0.121	0.809	0.4245
TIME22	1	0.0005863816	0.000281	2.085	0.0454
AP02	1	0.06451329	0.049	1.326	0.1946
AP03	1	0.09100967	0.058	1.567	0.1273
AP04	1	-0.02424514	0.063	-0.388	0.7008
AP05	1	0.06487573	0.058	1.112	0.2746
AP06	1	0.09736539	0.063	1.556	0.1298
AP07	1	0.04043128	0.057	0.714	0.4806
AP08	1	0.03956799	0.058	0.686	0.4977
AP09	1	0.03203731	0.056	0.571	0.5721
AP10	1	0.0007978221	0.062	0.013	0.9898
AP11	1	0.04953019	0.061	0.807	0.4258
AP12	1	0.02424045	0.060	0.404	0.6890
AP13	1	0.02689491	0.052	0.522	0.6057
TPH1	1	-0.36664893	1.235	-0.297	0.7685
TPH21	1	0.02117136	0.076	0.280	0.7815

Attachment 1 to Response to POIR #7-1 page 7 of 17

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9879

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	2.24527	DFE	88
MSE	0.025514	Root MSE	0.159732
SBC	4.701612	AIC	-72.3989
Reg Rsq	0.9733	Total Rsq	0.9733
Durbin-Watson	1.1453		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-126.886494	62.318	-2.036	0.0447
TPH	1	27.280183	15.348	1.777	0.0790
TPH2	1	-1.614626	0.958	-1.685	0.0955
MANR	1	20.036241	16.143	1.241	0.2179
MANR2	1	-0.612407	1.146	-0.534	0.5944
MANRTPH	1	-2.423689	2.030	-1.194	0.2358
TIM1TPH	1	0.0176342797	0.014	1.216	0.2271
TIM1MANR	1	0.040786848	0.017	2.445	0.0165
TIME1	1	-0.160106	0.121	-1.328	0.1875
TIME12	1	0.0010534124	0.000308	3.416	0.0010
TIM2TPH	1	0.144061	0.052	2.754	0.0072
TIM2MANR	1	0.128315	0.054	2.397	0.0186
TIME2	1	-1.190242	0.435	-2.733	0.0076
TIME22	1	-0.001502186	0.000676	-2.223	0.0288
AP02	1	0.0447607022	0.083	0.538	0.5916
AP03	1	-0.012719361	0.087	-0.146	0.8846
AP04	1	0.0407878456	0.097	0.423	0.6736
AP05	1	-0.009018275	0.085	-0.106	0.9154
AP06	1	0.117729	0.095	1.236	0.2197
AP07	1	0.0584898145	0.081	0.720	0.4737
AP08	1	0.0808675683	0.083	0.971	0.3344
AP09	1	0.071652584	0.088	0.810	0.4200
AP10	1	0.0866393309	0.085	1.024	0.3088
AP11	1	0.0314090159	0.087	0.362	0.7182
AP12	1	0.0844164052	0.087	0.973	0.3331
AP13	1	0.0347530069	0.083	0.417	0.6776
TPH1	1	4.060690	1.921	2.114	0.0373
TPH21	1	-0.227183	0.105	-2.158	0.0337

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1
0	0.019356	1.000000	| |******************** |
1	0.008241	0.425752	| |********* |

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9879

Preliminary MSE = 0.015847

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.42575247	0.09700900	-4.388794

Yule-Walker Estimates

SSE	1.670771	DFE	87
MSE	0.019204	Root MSE	0.138579
SBC	-24.6275	AIC	-104.482
Reg Rsq	0.9443	Total Rsq	0.9802
Durbin-Watson	1.9298		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-77.3935211	57.928	-1.336	0.1850
TPH	1	18.9452889	14.115	1.342	0.1830
TPH2	1	-1.1547717	0.880	-1.313	0.1927
MANR	1	19.4585961	14.664	1.327	0.1880
MANR2	1	-0.8939461	1.017	-0.879	0.3816
MANRTPH	1	-2.3824840	1.830	-1.302	0.1964
TIM1TPH	1	0.0103327	0.014	0.721	0.4729
TIM1MANR	1	0.0199484	0.018	1.125	0.2637
TIME1	1	-0.0915571	0.118	-0.774	0.4413
TIME12	1	0.0004590871	0.000297	1.546	0.1257
TIM2TPH	1	0.0708286	0.052	1.370	0.1743
TIM2MANR	1	0.0952485	0.053	1.786	0.0775
TIME2	1	-0.5317665	0.430	-1.236	0.2200
TIME22	1	-0.000367615	0.000692	-0.531	0.5968
AP02	1	0.0160917	0.062	0.259	0.7963
AP03	1	-0.0193328	0.076	-0.254	0.7999
AP04	1	0.0231671	0.085	0.273	0.7859
AP05	1	0.0348263	0.078	0.446	0.6567
AP06	1	0.0674360	0.085	0.798	0.4271
AP07	1	0.0614253	0.077	0.798	0.4270
AP08	1	0.0647670	0.079	0.818	0.4155
AP09	1	0.0478257	0.081	0.591	0.5559
AP10	1	0.0731423	0.078	0.940	0.3501
AP11	1	0.0200814	0.078	0.257	0.7977
AP12	1	0.0776175	0.075	1.041	0.3008
AP13	1	0.0246172	0.062	0.395	0.6936
TPH1	1	1.3529554	1.560	0.868	0.3881
TPH21	1	-0.0725287	0.085	-0.853	0.3961

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9882

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	1.461244	DFE	30
MSE	0.048708	Root MSE	0.220699
SBC	64.78231	AIC	7.089903
Reg Rsq	0.8459	Total Rsq	0.8459
Durbin-Watson	1.1304		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-98.5214715	86.201	-1.143	0.2621
TPH	1	18.5855413	15.058	1.234	0.2267
TPH2	1	-0.4110426	0.792	-0.519	0.6074
MANR	1	-47.3446106	14.568	-3.250	0.0028
MANR2	1	-2.5267826	1.172	-2.157	0.0392
MANRTPH	1	4.2033585	1.645	2.555	0.0159
TIM1TPH	1	-0.0680136	0.055	-1.233	0.2272
TIM1MANR	1	0.0378285	0.045	0.840	0.4074
TIME1	1	0.6052261	0.310	1.950	0.0606
TIME12	1	0.0008174431	0.003389	0.241	0.8110
TIM2TPH	1	0.0066094033	0.031	0.213	0.8331
TIM2MANR	1	-0.0959929	0.044	-2.199	0.0358
TIME2	1	-0.3222753	0.280	-1.151	0.2587
TIME22	1	0.000299519	0.000371	0.807	0.4262
AP02	1	0.1249506	0.217	0.576	0.5689
AP03	1	0.1331143	0.196	0.678	0.5027
AP04	1	0.3346043	0.180	1.857	0.0732
AP05	1	0.0930846	0.185	0.504	0.6177
AP06	1	0.1387946	0.204	0.679	0.5023
AP07	1	0.0762342	0.184	0.414	0.6815
AP08	1	0.1628515	0.199	0.818	0.4197
AP09	1	0.1935446	0.201	0.964	0.3429
AP10	1	0.1991010	0.216	0.920	0.3649
AP11	1	0.0949945	0.211	0.449	0.6564
AP12	1	0.2484862	0.191	1.300	0.2035
AP13	1	0.2669280	0.190	1.402	0.1711
TPH1	1	-8.2690688	8.286	-0.998	0.3263
TPH21	1	0.4665080	0.475	0.982	0.3338

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1
0	0.025194	1.000000	| |******************** |
1	0.010884	0.432017	| |********* |

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9882

Preliminary MSE = 0.020492

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.43201697	0.16747221	-2.579634

Yule-Walker Estimates

SSE	1.000303	DFE	29
MSE	0.034493	Root MSE	0.185723
SBC	47.06819	AIC	-12.6847
Reg Rsq	0.7608	Total Rsq	0.8945
Durbin-Watson	1.2078		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-35.1173634	71.563	-0.491	0.6273
TPH	1	10.8393012	11.324	0.957	0.3464
TPH2	1	-0.2540041	0.611	-0.415	0.6808
MANR	1	-25.8470667	11.565	-2.235	0.0333
MANR2	1	-1.5784036	0.888	-1.777	0.0861
MANRTPH	1	2.1994347	1.337	1.645	0.1109
TIM1TPH	1	-0.0508732	0.041	-1.231	0.2282
TIM1MANR	1	0.0220352	0.035	0.628	0.5349
TIME1	1	0.4603287	0.227	2.032	0.0514
TIME12	1	0.0002750777	0.002953	0.093	0.9264
TIM2TPH	1	0.0080786922	0.024	0.332	0.7419
TIM2MANR	1	-0.0622463	0.035	-1.759	0.0892
TIME2	1	-0.2534556	0.201	-1.261	0.2174
TIME22	1	0.0002429727	0.000348	0.699	0.4903
AP02	1	0.0431042	0.158	0.273	0.7867
AP03	1	0.1081266	0.166	0.653	0.5191
AP04	1	0.2431376	0.165	1.475	0.1509
AP05	1	0.0214398	0.167	0.128	0.8989
AP06	1	0.0262073	0.185	0.142	0.8882
AP07	1	0.006305777	0.168	0.037	0.9704
AP08	1	0.0824066	0.180	0.457	0.6508
AP09	1	0.1599920	0.178	0.899	0.3761
AP10	1	0.2335310	0.187	1.249	0.2218
AP11	1	0.1397009	0.182	0.766	0.4501
AP12	1	0.2479935	0.167	1.488	0.1476
AP13	1	0.2879662	0.145	1.983	0.0569
TPH1	1	-9.3639154	7.017	-1.334	0.1924
TPH21	1	0.5440662	0.403	1.350	0.1874

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9913

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	1.312944	DFE	33
MSE	0.039786	Root MSE	0.199465
SBC	54.06027	AIC	-5.0442
Reg Rsq	0.9190	Total Rsq	0.9190
Durbin-Watson	2.0739		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	5.6439150	20.855	0.271	0.7884
TPH	1	10.6653753	8.430	1.265	0.2147
TPH2	1	-1.1332649	0.867	-1.307	0.2003
MANR	1	68.6212877	43.201	1.588	0.1217
MANR2	1	-4.1979119	4.074	-1.030	0.3103
MANRTPH	1	-8.9730540	5.871	-1.528	0.1359
TIM1TPH	1	0.0525096	0.044	1.194	0.2410
TIM1MANR	1	0.0501697	0.058	0.859	0.3966
TIME1	1	-0.6351841	0.532	-1.195	0.2406
TIME12	1	0.0035460636	0.005393	0.657	0.5154
TIM2TPH	1	0.0173168	0.029	0.593	0.5570
TIM2MANR	1	0.1176718	0.082	1.441	0.1591
TIME2	1	-0.0421670	0.235	-0.180	0.8586
TIME22	1	0.0001997383	0.00033	0.605	0.5491
AP02	1	-0.1198418	0.167	-0.716	0.4792
AP03	1	0.1667776	0.192	0.868	0.3918
AP04	1	0.3007427	0.315	0.956	0.3462
AP05	1	-0.0852950	0.156	-0.548	0.5876
AP06	1	-0.1128740	0.176	-0.640	0.5263
AP07	1	0.1397135	0.170	0.820	0.4180
AP08	1	0.0293827	0.156	0.189	0.8514
AP09	1	-0.0173709	0.165	-0.105	0.9169
AP10	1	0.0568050	0.154	0.368	0.7151
AP11	1	0.1780422	0.166	1.071	0.2920
AP12	1	0.1714366	0.181	0.949	0.3493
AP13	1	0.2265893	0.181	1.253	0.2190
TPH1	1	-2.7859021	1.798	-1.550	0.1308
TPH21	1	0.1755245	0.115	1.520	0.1380

Estimates of Autocorrelations

```
 Lag  Covariance  Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1

  0    0.021524     1.000000 |                    |********************|
  1     -0.0008    -0.037239 |                   *|                    |
```

1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9913

Preliminary MSE = 0.021494

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	0.03723904	0.17665408	0.210802

Yule-Walker Estimates

SSE	1.310143	DFE	32
MSE	0.040942	Root MSE	0.202341
SBC	58.04224	AIC	-3.1731
Reg Rsq	0.9226	Total Rsq	0.9192
Durbin-Watson	2.0380		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	5.8983591	21.018	0.281	0.7808
TPH	1	10.6256881	8.613	1.234	0.2263
TPH2	1	-1.1284346	0.888	-1.271	0.2130
MANR	1	68.6531741	44.256	1.551	0.1307
MANR2	1	-4.1740974	4.172	-1.000	0.3246
MANRTPH	1	-8.9707945	6.014	-1.492	0.1456
TIM1TPH	1	0.0518762	0.045	1.157	0.2560
TIM1MANR	1	0.0508007	0.060	0.850	0.4019
TIME1	1	-0.6359624	0.545	-1.167	0.2518
TIME12	1	0.003653352	0.005512	0.663	0.5122
TIM2TPH	1	0.0178429	0.030	0.602	0.5517
TIM2MANR	1	0.1182727	0.084	1.416	0.1666
TIME2	1	-0.0467963	0.239	-0.196	0.8458
TIME22	1	0.0001976929	0.000334	0.592	0.5579
AP02	1	-0.1202169	0.173	-0.696	0.4912
AP03	1	0.1699763	0.196	0.868	0.3918
AP04	1	0.3028493	0.320	0.945	0.3517
AP05	1	-0.0884656	0.158	-0.559	0.5800
AP06	1	-0.1099280	0.179	-0.613	0.5443
AP07	1	0.1483038	0.174	0.853	0.3998
AP08	1	0.0328712	0.158	0.208	0.8367
AP09	1	-0.0130166	0.168	-0.077	0.9388
AP10	1	0.0606827	0.157	0.387	0.7016
AP11	1	0.1845857	0.169	1.090	0.2840
AP12	1	0.1846382	0.183	1.007	0.3214
AP13	1	0.2359157	0.185	1.275	0.2115
TPH1	1	-2.8367407	1.820	-1.559	0.1288
TPH21	1	0.1780237	0.117	1.523	0.1376

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9917

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	0.053838	DFE	16
MSE	0.003365	Root MSE	0.058007
SBC	-62.3781	AIC	-102.911
Reg Rsq	0.9743	Total Rsq	0.9743
Durbin-Watson	1.5272		

NOTE: Model is not full rank. OLS estimates for the parameters are not unique. Some statistics will be misleading. A reported DF of 0 or B means that the estimate is biased.
The parameter estimate for the following LHS variable is set to 0, since this variable is a linear combination of other RHS variables as shown.

TIM1TPH = 0
TIM1MANR = 0
TIME1 = 0
TIME12 = 0

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-34.8438101	24.666	-1.413	0.1769
TPH	1	5.9558524	4.064	1.466	0.1621
TPH2	1	-0.1176474	0.233	-0.506	0.6200
MANR	1	-5.6301459	3.201	-1.759	0.0977
MANR2	1	-0.0336502	0.062	-0.546	0.5923
MANRTPH	1	0.5897370	0.324	1.823	0.0871
TIM1TPH	0	0	.	.	.
TIM1MANR	0	0	.	.	.
TIME1	0	0	.	.	.
TIME12	0	0	.	.	.
TIM2TPH	1	-0.0319732	0.019	-1.721	0.1045
TIM2MANR	1	-0.007364229	0.005123	-1.438	0.1698
TIME2	1	0.2682335	0.170	1.582	0.1332
TIME22	1	0.000237893	0.000133	1.795	0.0916
AP02	1	-0.0106304	0.048	-0.220	0.8289
AP03	1	-0.000353679	0.051	-0.007	0.9946
AP04	1	0.0787358	0.091	0.866	0.3993
AP05	1	-0.0681130	0.053	-1.280	0.2188
AP06	1	0.0495543	0.062	0.804	0.4331
AP07	1	-0.0224048	0.068	-0.331	0.7446
AP08	1	-0.005059684	0.057	-0.088	0.9307
AP09	1	-0.0271159	0.055	-0.493	0.6287
AP10	1	0.0019555928	0.056	0.035	0.9724
AP11	1	0.0172405	0.052	0.332	0.7440
AP12	1	0.0163254	0.052	0.317	0.7555
AP13	1	0.0282874	0.048	0.590	0.5638
TPH1	1	-0.5448811	2.835	-0.192	0.8500

1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9917

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
TPH21	1	0.0226613	0.154	0.148	0.8845

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1
0	0.001346	1.000000	|********************|
1	0.000313	0.232904	|*****|

Preliminary MSE = 0.001273

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.23290419	0.25109834	-0.927542

Yule-Walker Estimates

SSE	0.049416	DFE	15
MSE	0.003294	Root MSE	0.057397
SBC	-62.0612	AIC	-104.283
Reg Rsq	0.9748	Total Rsq	0.9764
Durbin-Watson	1.6191		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-35.1023429	23.353	-1.503	0.1536
TPH	1	6.4446605	3.741	1.723	0.1055
TPH2	1	-0.1476487	0.212	-0.696	0.4968
MANR	1	-5.1841824	3.015	-1.720	0.1061
MANR2	1	-0.0438356	0.059	-0.744	0.4686
MANRTPH	1	0.5328435	0.308	1.732	0.1039
TIM1TPH	0	0	.	.	.
TIM1MANR	0	0	.	.	.
TIME1	0	0	.	.	.
TIME12	0	0	.	.	.
TIM2TPH	1	-0.0335430	0.019	-1.796	0.0927
TIM2MANR	1	-0.006258942	0.005553	-1.127	0.2774
TIME2	1	0.2877194	0.170	1.690	0.1117
TIME22	1	0.0002200234	0.000145	1.517	0.1502
AP02	1	-0.009518387	0.043	-0.221	0.8283
AP03	1	-0.00038736	0.051	-0.008	0.9940
AP04	1	0.0946349	0.094	1.006	0.3304
AP05	1	-0.0646459	0.053	-1.216	0.2428
AP06	1	0.0546862	0.063	0.865	0.4006

1 BCS OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9917

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
AP07	1	-0.00705241	0.067	-0.105	0.9181
AP08	1	0.0032694374	0.058	0.056	0.9558
AP09	1	-0.0213618	0.056	-0.383	0.7073
AP10	1	0.0168397	0.056	0.298	0.7695
AP11	1	0.0270611	0.052	0.520	0.6107
AP12	1	0.0211878	0.050	0.424	0.6777
AP13	1	0.0344009	0.043	0.794	0.4397
TPH1	1	-0.9780274	2.759	-0.355	0.7279
TPH21	1	0.0471584	0.149	0.316	0.7563

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9961

Dependent Variable = HRS

Ordinary Least Squares Estimates

SSE	0.148214	DFE	48
MSE	0.003088	Root MSE	0.055568
SBC	-137.288	AIC	-202.548
Reg Rsq	0.9810	Total Rsq	0.9810
Durbin-Watson	1.5239		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	122.062848	37.122	3.288	0.0019
TPH	1	-14.727537	7.358	-2.002	0.0510
TPH2	1	0.719804	0.397	1.812	0.0763
MANR	1	10.348673	11.715	0.883	0.3814
MANR2	1	0.145732	0.347	0.420	0.6762
MANRTPH	1	-0.970568	1.195	-0.812	0.4208
TIM1TPH	1	0.0011402177	0.009539	0.120	0.9054
TIM1MANR	1	0.0037886583	0.006936	0.546	0.5874
TIME1	1	-0.004204346	0.092	-0.046	0.9636
TIME12	1	0.0000138594	0.000124	0.112	0.9115
TIM2TPH	1	-0.033391499	0.019	-1.758	0.0851
TIM2MANR	1	0.0046169252	0.015	0.300	0.7654
TIME2	1	0.360100	0.182	1.981	0.0533
TIME22	1	-0.000065002	0.000157	-0.414	0.6804
AP02	1	0.0103688634	0.043	0.244	0.8085
AP03	1	0.043608986	0.047	0.931	0.3565
AP04	1	0.0517948226	0.061	0.843	0.4034
AP05	1	-0.084176913	0.043	-1.939	0.0584
AP06	1	0.0426301958	0.061	0.698	0.4886
AP07	1	0.0502631357	0.040	1.252	0.2167
AP08	1	0.052019181	0.040	1.295	0.2015
AP09	1	0.0746561018	0.046	1.610	0.1139
AP10	1	-0.002424138	0.044	-0.055	0.9562
AP11	1	-0.003498472	0.043	-0.082	0.9353
AP12	1	0.0476881881	0.043	1.122	0.2675
AP13	1	0.0405313921	0.043	0.952	0.3459
TPH1	1	-7.305763	3.404	-2.146	0.0370
TPH21	1	0.346522	0.167	2.078	0.0431

Estimates of Autocorrelations

```
 Lag  Covariance  Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1

   0     0.00195     1.000000 |                    |********************|
   1    0.000437     0.224334 |                    |****                |
```

Attachment 1 to Response to POIR #7-1 page 17 of 17

USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Autoreg Procedure

IDNUM=9961

Preliminary MSE = 0.001852

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.22433417	0.14214723	-1.578182

Yule-Walker Estimates

SSE	0.13782	DFE	47
MSE	0.002932	Root MSE	0.054151
SBC	-138.431	AIC	-206.023
Reg Rsq	0.9723	Total Rsq	0.9824
Durbin-Watson	1.6935		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	111.707974	36.990	3.020	0.0041
TPH	1	-14.395463	7.167	-2.009	0.0503
TPH2	1	0.723906	0.391	1.853	0.0701
MANR	1	6.746237	10.975	0.615	0.5417
MANR2	1	0.119636	0.349	0.342	0.7335
MANRTPH	1	-0.626167	1.117	-0.561	0.5777
TIM1TPH	1	0.002412614	0.009429	0.256	0.7992
TIM1MANR	1	0.0020286512	0.006279	0.323	0.7481
TIME1	1	-0.02098352	0.090	-0.232	0.8174
TIME12	1	0.0000182106	0.000134	0.136	0.8925
TIM2TPH	1	-0.030892439	0.018	-1.680	0.0996
TIM2MANR	1	0.0017103852	0.015	0.115	0.9087
TIME2	1	0.328463	0.174	1.884	0.0658
TIME22	1	-0.000044333	0.000154	-0.288	0.7747
AP02	1	0.0041633002	0.039	0.107	0.9149
AP03	1	0.0283027581	0.045	0.622	0.5369
AP04	1	0.0341619704	0.061	0.565	0.5751
AP05	1	-0.077716922	0.042	-1.838	0.0723
AP06	1	0.0260502925	0.059	0.441	0.6611
AP07	1	0.0394506186	0.040	0.995	0.3248
AP08	1	0.0441435719	0.040	1.106	0.2742
AP09	1	0.0613861914	0.045	1.354	0.1823
AP10	1	-0.01506881	0.043	-0.351	0.7274
AP11	1	-0.017882436	0.042	-0.427	0.6711
AP12	1	0.0361022686	0.041	0.877	0.3851
AP13	1	0.0267253266	0.039	0.682	0.4985
TPH1	1	-6.107688	3.250	-1.879	0.0664
TPH21	1	0.291538	0.160	1.822	0.0748

Manual Letters

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	19	0.803	0.0059	135.410	7.892
2	26	0.791	0.0074	106.560	7.369
3	104	0.786	0.0069	113.528	7.595
4	120	0.721	0.0078	92.600	9.782
5	164	0.761	0.0073	104.479	8.280
6	242	0.733	0.0073	99.880	9.168
7	341	0.783	0.0071	110.855	7.606
8	401	0.718	0.0078	91.514	9.254
9	415	0.706	0.0081	87.413	9.815
10	503	0.726	0.0076	96.140	9.320
11	523	0.816	0.0055	147.836	7.812
12	614	0.777	0.0074	104.897	7.648
13	621	0.721	0.0077	93.768	9.616
14	659	0.821	0.0059	139.373	7.061
15	686	0.688	0.0088	78.302	10.438
16	754	0.750	0.0074	101.271	8.440
17	779	0.754	0.0069	109.649	8.641
18	829	0.851	0.0044	191.621	7.189
19	862	0.710	0.0081	87.419	9.325
20	877	0.726	0.0076	96.151	9.292
21	916	0.740	0.0074	99.672	8.884
22	952	0.721	0.0078	92.172	9.212
23	1245	0.693	0.0085	81.659	10.133
24	1309	0.769	0.0069	111.560	8.064
25	1364	0.750	0.0076	99.074	8.308
26	1374	0.761	0.0067	114.383	8.578
27	1423	0.780	0.0071	109.849	7.684
28	1484	0.820	0.0051	160.885	7.574
29	1485	0.711	0.0080	89.146	9.615
30	1607	0.785	0.0066	119.284	7.855
31	1684	0.700	0.0085	82.220	9.793
32	1747	0.774	0.0075	103.285	7.786
33	1749	0.727	0.0077	94.798	9.108
34	1803	0.689	0.0087	79.083	10.387
35	1872	0.714	0.0082	87.356	10.067
36	1913	0.755	0.0068	111.168	8.703
37	1940	0.846	0.0057	149.147	6.533
38	2007	0.754	0.0069	109.433	8.897
39	2033	0.743	0.0073	101.709	8.695
40	2169	0.693	0.0085	81.491	10.179
41	2173	0.770	0.0064	121.021	8.456
42	2283	0.780	0.0071	109.982	7.777
43	2371	0.764	0.0069	110.107	8.288
44	2375	0.758	0.0077	98.317	8.045
45	2386	0.806	0.0055	146.974	7.863
46	2444	0.712	0.0081	87.894	9.603
47	2467	0.794	0.0071	112.669	7.338
48	2501	0.791	0.0079	100.242	7.204
49	2587	0.746	0.0071	104.441	8.762
50	2594	0.762	0.0068	112.737	8.396
51	2687	0.727	0.0075	96.415	9.269
52	2696	0.833	0.0065	127.474	8.367
53	2752	0.846	0.0046	184.266	7.349
54	2814	0.811	0.0061	132.796	7.233
55	2823	0.720	0.0077	92.925	9.707
56	3033	0.781	0.0068	115.157	7.783
57	3084	0.780	0.0066	117.572	7.903
58	3246	0.804	0.0066	121.382	7.323
59	3294	0.853	0.0062	137.732	7.818
60	3304	0.679	0.0094	72.133	10.867
61	3329	0.812	0.0061	132.299	8.353
62	3346	0.766	0.0068	112.680	8.292
63	3358	0.731	0.0074	98.338	9.278
64	3359	0.742	0.0072	103.671	8.853
65	3361	0.759	0.0071	106.884	8.411
66	3364	0.677	0.0094	71.903	10.871
67	3394	0.748	0.0070	106.451	8.758

68	3411	0.731	0.0076	95.656	8.982
69	3437	0.729	0.0074	98.050	9.209
70	3495	0.874	0.0050	174.709	7.202
71	3547	0.856	0.0057	149.429	7.807
72	3593	0.783	0.0067	117.468	7.868
73	3594	0.833	0.0065	127.978	8.336
74	3606	0.791	0.0062	127.566	7.816
75	3645	0.887	0.0048	186.309	7.090
76	3702	0.745	0.0072	103.993	8.783
77	3709	0.765	0.0084	90.932	7.659
78	3712	0.898	0.0045	201.416	6.839
79	3725	0.705	0.0081	86.650	9.857
80	3753	0.731	0.0076	96.118	8.987
81	3782	0.827	0.0064	128.821	8.381
82	3821	0.764	0.0068	112.151	8.255
83	3908	0.716	0.0078	91.299	9.516
84	3921	0.766	0.0074	104.265	8.020
85	3923	0.825	0.0069	120.093	6.670
86	3940	0.802	0.0060	133.186	7.522
87	3972	0.760	0.0071	107.836	8.417
88	3997	0.807	0.0066	121.721	7.217
89	4144	0.849	0.0060	142.235	7.972
90	4166	0.797	0.0060	133.768	7.705
91	4183	0.764	0.0065	116.975	8.500
92	4255	0.781	0.0064	123.005	7.966
93	4256	0.812	0.0060	134.617	8.020
94	4270	0.710	0.0080	88.383	9.890
95	4278	0.839	0.0047	177.891	7.395
96	4284	0.819	0.0056	146.851	8.075
97	4347	0.788	0.0060	131.260	7.956
98	4384	0.838	0.0048	175.881	7.489
99	4385	0.832	0.0049	170.419	7.581
100	4439	0.729	0.0077	95.148	9.053
101	4453	0.718	0.0079	91.314	9.838
102	4483	0.874	0.0047	187.458	7.052
103	4537	0.762	0.0075	101.971	8.116
104	4538	0.762	0.0076	99.660	8.010
105	4542	0.726	0.0075	96.534	9.410
106	4653	0.763	0.0079	96.942	9.671
107	4756	0.723	0.0076	94.820	9.563
108	4818	0.773	0.0072	107.619	7.849
109	4834	0.826	0.0054	153.434	7.873
110	4873	0.812	0.0068	119.519	7.060
111	4920	0.791	0.0062	128.647	7.775
112	4937	0.825	0.0051	161.811	7.458
113	4945	0.742	0.0074	99.645	8.720
114	4965	0.884	0.0049	182.233	7.161
115	4970	0.762	0.0066	115.301	8.543
116	5057	0.721	0.0077	93.284	9.349
117	5066	0.769	0.0074	103.684	7.940
118	5087	0.712	0.0079	90.040	9.718
119	5096	0.709	0.0081	87.939	9.559
120	5106	0.746	0.0075	99.488	8.617
121	5113	0.768	0.0068	113.659	8.896
122	5182	0.735	0.0074	99.578	9.048
123	5201	0.847	0.0064	132.219	7.953
124	5204	0.723	0.0076	94.995	9.430
125	5255	0.767	0.0069	111.440	8.122
126	5279	0.802	0.0070	114.958	7.188
127	5284	0.743	0.0081	92.277	8.378
128	5296	0.695	0.0087	80.229	10.376
129	5341	0.784	0.0061	128.390	8.047
130	5413	0.785	0.0063	125.440	7.885
131	5417	0.845	0.0048	175.918	7.411
132	5438	0.800	0.0060	133.059	7.571
133	5507	0.740	0.0083	88.712	8.307
134	5525	0.853	0.0045	190.589	7.029
135	5563	0.838	0.0047	177.661	7.441
136	5566	0.788	0.0063	124.176	7.917
137	5573	0.806	0.0058	139.309	7.615

138	5590	0.741	0.0083	89.327	8.316
139	5604	0.796	0.0064	123.757	7.520
140	5656	0.851	0.0055	154.650	6.480
141	5683	0.793	0.0057	138.253	8.075
142	5697	0.704	0.0082	86.178	9.958
143	5708	0.724	0.0076	95.610	9.541
144	5757	0.810	0.0060	134.346	7.283
145	5837	0.729	0.0075	97.873	9.274
146	5865	0.742	0.0079	94.316	8.520
147	5909	0.731	0.0075	97.603	9.114
148	5921	0.775	0.0061	126.147	8.494
149	5997	0.710	0.0081	88.166	9.931
150	6048	0.830	0.0061	136.220	6.787
151	6063	0.827	0.0056	148.454	8.108
152	6078	0.725	0.0081	89.448	8.803
153	6083	0.804	0.0068	118.677	7.183
154	6088	0.768	0.0065	118.066	8.332
155	6098	0.792	0.0065	121.624	7.560
156	6104	0.724	0.0076	95.033	9.612
157	6218	0.794	0.0059	135.267	7.903
158	6266	0.710	0.0081	87.767	9.464
159	6282	0.736	0.0072	102.025	9.172
160	6306	0.763	0.0070	109.216	8.195
161	6332	0.719	0.0079	91.057	9.133
162	6343	0.798	0.0065	122.397	7.433
163	6391	0.802	0.0057	141.362	7.740
164	6499	0.797	0.0063	127.386	7.560
165	6549	0.699	0.0084	83.709	10.127
166	6550	0.814	0.0059	138.669	8.395
167	6551	0.820	0.0066	123.605	8.430
168	6556	0.807	0.0068	118.017	7.095
169	6557	0.767	0.0075	102.798	7.966
170	6571	0.761	0.0066	114.629	8.761
171	6594	0.762	0.0073	104.284	8.313
172	6635	0.824	0.0052	159.814	7.304
173	6643	0.731	0.0079	92.306	8.830
174	6655	0.769	0.0066	116.868	8.477
175	6664	0.749	0.0069	108.737	9.108
176	6737	0.810	0.0061	132.831	7.307
177	6744	0.761	0.0067	113.032	8.481
178	6745	0.762	0.0067	114.589	8.527
179	6755	0.677	0.0092	73.602	10.724
180	6761	0.776	0.0070	111.347	7.636
181	6792	0.793	0.0075	106.552	7.302
182	6838	0.757	0.0072	105.268	8.540
183	6971	0.789	0.0066	119.435	8.414
184	6989	0.753	0.0070	107.999	8.644
185	6994	0.756	0.0068	112.098	8.616
186	7010	0.772	0.0068	113.437	8.034
187	7044	0.796	0.0061	129.693	7.783
188	7049	0.813	0.0057	143.793	8.101
189	7051	0.801	0.0070	114.484	7.237
190	7069	0.751	0.0078	95.815	8.253
191	7073	0.724	0.0080	90.228	9.002
192	7093	0.801	0.0059	135.636	8.167
193	7097	0.840	0.0048	174.138	7.439
194	7100	0.769	0.0064	120.565	8.411
195	7123	0.745	0.0073	102.112	8.601
196	7126	0.758	0.0067	112.847	8.582
197	7127	0.815	0.0059	137.687	7.218
198	7178	0.843	0.0044	190.869	7.352
199	7192	0.785	0.0060	130.442	8.051
200	7198	0.831	0.0056	148.946	7.959
201	7271	0.735	0.0075	98.474	8.963
202	7314	0.717	0.0078	92.506	9.429
203	7346	0.746	0.0071	104.861	8.794
204	7418	0.719	0.0078	92.602	9.403
205	7422	0.742	0.0075	99.545	8.698
206	7444	0.738	0.0072	102.726	9.112
207	7450	0.742	0.0075	99.114	8.793

208	7463	0.747	0.0069	108.099	9.037
209	7480	0.817	0.0054	152.281	7.894
210	7512	0.825	0.0054	152.323	7.188
211	7564	0.758	0.0067	112.520	8.634
212	7583	0.773	0.0068	113.388	8.092
213	7603	0.788	0.0062	127.556	7.864
214	7606	0.769	0.0065	118.804	8.792
215	7626	0.794	0.0066	119.590	7.572
216	7637	0.791	0.0069	115.455	7.502
217	7655	0.699	0.0083	84.406	9.938
218	7689	0.723	0.0076	94.780	9.251
219	7791	0.742	0.0071	104.837	9.207
220	7794	0.833	0.0049	170.015	7.604
221	7800	0.753	0.0077	97.852	8.259
222	7807	0.785	0.0064	122.513	8.542
223	7865	0.787	0.0059	134.243	8.210
224	7884	0.779	0.0078	99.385	9.419
225	7897	0.739	0.0074	100.391	8.862
226	7914	0.773	0.0065	118.340	8.373
227	7942	0.854	0.0050	172.667	7.404
228	8004	0.832	0.0051	164.556	7.135
229	8112	0.774	0.0073	106.057	7.829
230	8115	0.774	0.0064	121.743	8.196
231	8145	0.812	0.0061	133.574	8.345
232	8153	0.831	0.0050	165.097	7.628
233	8169	0.786	0.0065	121.399	7.899
234	8195	0.707	0.0081	87.680	9.705
235	8208	0.791	0.0059	135.118	8.348
236	8228	0.820	0.0051	161.379	7.522
237	8239	0.690	0.0087	79.668	10.329
238	8265	0.779	0.0067	116.311	7.944
239	8289	0.693	0.0085	81.254	10.226
240	8315	0.783	0.0072	108.390	7.609
241	8329	0.780	0.0063	123.439	8.048
242	8333	0.717	0.0080	89.243	9.204
243	8334	0.820	0.0068	121.349	6.816
244	8342	0.739	0.0075	98.778	8.803
245	8378	0.714	0.0081	88.188	9.322
246	8384	0.756	0.0075	100.674	8.237
247	8421	0.715	0.0079	90.273	9.649
248	8439	0.768	0.0065	118.779	8.386
249	8505	0.770	0.0072	107.617	8.054
250	8535	0.766	0.0066	116.659	8.446
251	8551	0.803	0.0056	142.437	7.711
252	8554	0.797	0.0058	136.533	8.347
253	8557	0.771	0.0066	117.096	8.897
254	8579	0.772	0.0065	118.354	8.186
255	8592	0.793	0.0069	114.551	7.403
256	8668	0.803	0.0056	144.233	7.825
257	8692	0.806	0.0079	102.390	6.854
258	8743	0.704	0.0082	86.194	9.974
259	8806	0.777	0.0067	115.488	7.997
260	8909	0.760	0.0071	106.419	8.300
261	8938	0.781	0.0064	121.540	8.009
262	8941	0.779	0.0067	116.969	7.881
263	8942	0.812	0.0056	144.983	8.139
264	8964	0.740	0.0072	103.434	9.083
265	8965	0.770	0.0066	116.655	8.199
266	9035	0.890	0.0049	180.930	6.953
267	9056	0.743	0.0070	105.989	9.060
268	9090	0.786	0.0066	119.186	7.816
269	9098	0.783	0.0061	128.548	8.083
270	9110	0.788	0.0060	130.833	8.018
271	9112	0.730	0.0081	89.912	8.659
272	9114	0.690	0.0086	80.092	10.277
273	9210	0.705	0.0086	82.492	9.317
274	9221	0.786	0.0068	115.635	7.725
275	9240	0.703	0.0083	84.966	10.074
276	9242	0.779	0.0064	122.006	8.069
277	9263	0.760	0.0068	111.586	8.431

278	9270	0.776	0.0065	118.987	8.034
279	9303	0.730	0.0078	93.971	8.929
280	9322	0.747	0.0069	107.694	8.900
281	9443	0.795	0.0058	136.562	7.868
282	9486	0.701	0.0083	84.924	9.757
283	9522	0.772	0.0069	111.367	7.959
284	9524	0.697	0.0084	82.757	10.147
285	9562	0.809	0.0055	148.077	7.962
286	9567	0.857	0.0049	175.807	7.396
287	9589	0.688	0.0086	79.723	10.218
288	9605	0.798	0.0057	139.980	8.228
289	9607	0.829	0.0051	164.037	7.281
290	9653	0.827	0.0054	152.839	7.692
291	9660	0.887	0.0048	185.560	7.103
292	9666	0.806	0.0068	118.494	7.198
293	9696	0.753	0.0074	102.327	8.428
294	9698	0.816	0.0063	130.271	7.069
295	9705	0.839	0.0065	129.102	6.554
296	9749	0.828	0.0051	163.283	7.272
297	9775	0.840	0.0054	155.220	7.788
298	9779	0.749	0.0070	107.508	8.776
299	9792	0.796	0.0074	108.194	7.235
300	9807	0.698	0.0084	83.584	10.104
301	9809	0.831	0.0058	143.298	8.239
302	9810	0.775	0.0062	124.261	8.278
303	9865	0.801	0.0056	143.133	8.149
304	9875	0.804	0.0063	128.588	7.456
305	9879	0.735	0.0073	100.880	9.371
306	9882	0.830	0.0054	153.512	7.016
307	9913	0.818	0.0055	149.806	8.192
308	9917	0.800	0.0076	105.966	7.080
309	9961	0.740	0.0072	102.996	9.286

Manual Flats

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	26	0.831	0.0071	116.454	6.412
2	104	0.851	0.0063	135.821	6.665
3	120	0.851	0.0080	106.100	8.935
4	164	0.842	0.0067	124.897	7.843
5	242	0.838	0.0074	113.423	8.538
6	336	0.931	0.0068	137.057	7.022
7	341	0.816	0.0084	97.176	6.001
8	401	0.795	0.0079	100.981	8.049
9	415	0.802	0.0081	99.221	8.818
10	503	0.826	0.0073	113.852	8.317
11	507	0.939	0.0065	143.588	6.763
12	523	0.932	0.0063	147.423	7.085
13	614	0.834	0.0068	122.203	6.772
14	621	0.837	0.0072	115.820	8.403
15	659	0.932	0.0058	160.074	7.413
16	686	0.802	0.0092	86.850	9.694
17	754	0.798	0.0079	101.581	7.207
18	779	0.836	0.0066	126.095	7.708
19	829	0.966	0.0048	203.342	6.233
20	862	0.801	0.0079	101.750	8.478
21	877	0.807	0.0075	107.636	8.099
22	916	0.818	0.0073	111.981	7.994
23	952	0.811	0.0074	109.485	8.078
24	1245	0.800	0.0086	93.420	9.224
25	1309	0.887	0.0057	155.549	7.246
26	1364	0.809	0.0076	106.340	7.057
27	1374	0.840	0.0066	126.923	7.808
28	1423	0.847	0.0064	131.461	6.580
29	1484	0.937	0.0059	159.978	7.125
30	1485	0.814	0.0077	105.555	8.604
31	1607	0.838	0.0067	125.621	6.811
32	1684	0.808	0.0077	104.889	8.473
33	1749	0.796	0.0078	101.939	8.059
34	1803	0.804	0.0090	89.171	9.559
35	1872	0.842	0.0083	101.857	9.096

36	1913	0.835	0.0066	126.363	7.578
37	1940	0.945	0.0055	171.895	6.870
38	2007	0.779	0.0102	76.186	6.472
39	2033	0.812	0.0073	110.972	7.567
40	2169	0.794	0.0081	97.903	8.678
41	2173	0.864	0.0060	144.535	7.525
42	2283	0.850	0.0064	133.474	6.980
43	2371	0.841	0.0065	129.555	7.634
44	2375	0.806	0.0081	99.056	6.482
45	2386	0.922	0.0066	140.572	7.502
46	2390	0.922	0.0068	135.865	7.368
47	2444	0.811	0.0083	97.910	9.095
48	2467	0.837	0.0070	119.345	6.461
49	2501	0.817	0.0079	103.733	6.377
50	2587	0.834	0.0070	119.857	8.129
51	2594	0.874	0.0063	138.079	7.588
52	2687	0.825	0.0074	112.211	8.391
53	2696	0.958	0.0050	191.730	6.473
54	2814	0.902	0.0053	170.125	6.938
55	2823	0.813	0.0078	103.888	8.698
56	3033	0.843	0.0065	130.480	6.847
57	3084	0.804	0.0082	97.551	6.461
58	3246	0.848	0.0065	130.104	6.351
59	3294	0.953	0.0052	182.858	6.626
60	3304	0.799	0.0095	83.805	9.881
61	3329	0.944	0.0056	170.002	6.911
62	3346	0.855	0.0062	138.448	7.600
63	3358	0.814	0.0075	108.749	8.341
64	3359	0.821	0.0071	115.443	7.778
65	3361	0.831	0.0070	118.380	6.580
66	3364	0.781	0.0094	82.846	9.762
67	3394	0.842	0.0066	128.662	7.732
68	3411	0.799	0.0077	103.415	7.854
69	3437	0.835	0.0072	116.682	8.177
70	3495	0.947	0.0054	174.289	6.811
71	3579	0.970	0.0044	220.559	6.421
72	3593	0.850	0.0066	129.596	6.365
73	3594	0.961	0.0047	203.430	6.678
74	3606	0.861	0.0058	147.696	7.120
75	3702	0.851	0.0064	134.050	7.724
76	3709	0.809	0.0077	104.534	6.823
77	3725	0.807	0.0078	103.964	8.549
78	3753	0.803	0.0077	104.299	7.784
79	3782	0.932	0.0051	184.055	6.977
80	3821	0.870	0.0070	125.069	8.017
81	3908	0.810	0.0077	105.837	8.462
82	3921	0.813	0.0077	105.236	6.645
83	3923	0.901	0.0050	180.660	6.566
84	3940	0.870	0.0057	152.459	6.508
85	3972	0.821	0.0071	115.086	7.153
86	3997	0.837	0.0073	114.371	6.065
87	4166	0.883	0.0054	163.801	6.789
88	4183	0.851	0.0063	135.815	7.298
89	4255	0.872	0.0058	150.284	7.156
90	4256	0.926	0.0060	153.608	6.774
91	4270	0.828	0.0080	103.660	8.930
92	4278	0.932	0.0067	140.161	6.987
93	4284	0.915	0.0049	187.865	6.418
94	4347	0.869	0.0057	152.190	6.845
95	4384	0.930	0.0061	151.309	7.340
96	4439	0.786	0.0081	96.975	8.018
97	4453	0.842	0.0080	105.269	8.941
98	4483	0.949	0.0054	174.692	6.669
99	4537	0.816	0.0073	111.995	7.166
100	4538	0.823	0.0074	111.589	7.250
101	4542	0.821	0.0075	109.241	8.517
102	4653	0.916	0.0066	138.158	8.072
103	4756	0.812	0.0077	105.595	8.536
104	4818	0.856	0.0061	140.886	7.131
105	4834	0.924	0.0065	143.129	7.431

106	4873	0.818	0.0085	95.994	5.745
107	4920	0.865	0.0058	148.466	6.879
108	4937	0.933	0.0058	161.731	7.510
109	4945	0.838	0.0065	128.052	7.578
110	4965	0.981	0.0040	246.430	6.062
111	4970	0.860	0.0064	133.523	7.920
112	5057	0.805	0.0075	106.847	7.734
113	5087	0.805	0.0080	101.206	8.709
114	5096	0.811	0.0080	101.267	8.884
115	5106	0.816	0.0075	108.645	7.408
116	5113	0.879	0.0070	125.618	7.938
117	5182	0.837	0.0070	118.929	8.281
118	5201	0.946	0.0056	169.218	6.776
119	5204	0.835	0.0073	114.796	8.435
120	5255	0.856	0.0060	141.721	6.894
121	5279	0.883	0.0053	165.948	6.547
122	5296	0.802	0.0084	95.124	9.135
123	5341	0.854	0.0063	136.156	6.935
124	5413	0.868	0.0057	151.264	6.780
125	5417	0.945	0.0056	168.828	6.799
126	5438	0.886	0.0054	163.371	6.929
127	5507	0.766	0.0090	84.736	7.510
128	5525	0.944	0.0053	178.164	6.937
129	5563	0.950	0.0051	186.922	6.974
130	5566	0.854	0.0063	136.728	6.821
131	5573	0.871	0.0056	155.502	6.853
132	5590	0.806	0.0075	107.014	7.563
133	5604	0.929	0.0060	155.154	7.397
134	5656	0.952	0.0052	181.570	6.661
135	5683	0.920	0.0066	139.290	7.615
136	5697	0.822	0.0087	94.366	9.378
137	5708	0.834	0.0073	113.585	8.483
138	5757	0.855	0.0062	138.019	6.484
139	5837	0.824	0.0070	117.549	7.904
140	5865	0.787	0.0084	94.003	7.291
141	5909	0.832	0.0073	114.010	8.426
142	5921	0.868	0.0058	149.323	7.399
143	5997	0.831	0.0075	111.554	8.542
144	6048	0.902	0.0049	183.926	6.377
145	6063	0.936	0.0059	159.359	7.139
146	6078	0.790	0.0081	97.249	8.276
147	6088	0.847	0.0064	132.493	7.451
148	6098	0.896	0.0051	174.783	6.672
149	6104	0.829	0.0079	105.176	8.862
150	6218	0.919	0.0067	137.040	7.591
151	6266	0.784	0.0083	95.067	8.506
152	6282	0.840	0.0070	119.609	8.093
153	6306	0.839	0.0065	128.190	7.028
154	6332	0.795	0.0082	97.401	8.665
155	6343	0.856	0.0064	134.428	6.214
156	6391	0.919	0.0066	138.813	7.620
157	6499	0.863	0.0059	147.028	6.761
158	6543	0.878	0.0067	131.895	7.926
159	6549	0.810	0.0088	92.351	9.414
160	6550	0.933	0.0060	154.909	7.244
161	6551	0.939	0.0057	163.675	7.049
162	6556	0.876	0.0059	149.816	6.311
163	6557	0.805	0.0081	99.937	6.522
164	6571	0.853	0.0066	129.989	7.976
165	6594	0.825	0.0069	119.878	7.572
166	6635	0.940	0.0057	164.480	7.023
167	6643	0.806	0.0075	107.665	7.909
168	6655	0.871	0.0063	137.559	7.437
169	6664	0.860	0.0068	126.071	8.204
170	6676	0.850	0.0066	128.933	6.810
171	6737	0.857	0.0063	136.454	6.321
172	6744	0.847	0.0064	133.091	7.633
173	6745	0.867	0.0061	143.369	7.627
174	6755	0.766	0.0096	79.834	9.772
175	6761	0.876	0.0060	145.010	7.442

176	6763	0.862	0.0068	125.902	7.562
177	6792	0.839	0.0067	125.429	6.661
178	6838	0.832	0.0070	119.358	7.550
179	6971	0.928	0.0069	133.574	7.110
180	6989	0.830	0.0068	122.133	7.724
181	6994	0.833	0.0067	123.990	7.488
182	7010	0.819	0.0073	111.734	6.854
183	7044	0.853	0.0063	134.842	6.448
184	7049	0.934	0.0060	154.531	7.123
185	7051	0.855	0.0063	135.843	6.344
186	7069	0.774	0.0092	84.610	6.793
187	7073	0.793	0.0079	100.362	6.083
188	7093	0.916	0.0070	131.381	7.584
189	7097	0.936	0.0060	157.322	7.067
190	7100	0.875	0.0062	140.832	7.622
191	7126	0.864	0.0062	138.453	7.570
192	7127	0.920	0.0060	154.025	7.322
193	7192	0.882	0.0054	164.018	6.847
194	7198	0.951	0.0053	181.331	6.676
195	7271	0.829	0.0074	111.857	8.497
196	7314	0.832	0.0077	108.699	8.573
197	7346	0.833	0.0070	118.362	8.116
198	7418	0.810	0.0079	102.745	8.723
199	7422	0.828	0.0068	121.090	7.697
200	7444	0.835	0.0070	119.160	8.226
201	7450	0.832	0.0075	110.486	8.020
202	7463	0.828	0.0075	110.475	7.717
203	7480	0.946	0.0055	173.602	6.825
204	7564	0.853	0.0065	131.336	7.599
205	7583	0.844	0.0065	129.407	7.025
206	7603	0.840	0.0066	128.032	6.814
207	7606	0.869	0.0057	152.570	7.060
208	7626	0.918	0.0069	133.345	7.498
209	7637	0.870	0.0060	144.530	6.347
210	7655	0.794	0.0082	97.411	8.742
211	7689	0.840	0.0075	111.603	8.507
212	7791	0.862	0.0074	116.422	8.564
213	7794	0.939	0.0057	163.871	7.045
214	7800	0.837	0.0066	126.646	7.693
215	7807	0.863	0.0061	142.608	6.832
216	7865	0.927	0.0063	147.980	7.408
217	7884	0.911	0.0070	130.835	8.195
218	7897	0.806	0.0076	106.010	7.267
219	7914	0.854	0.0064	134.511	7.148
220	7942	0.955	0.0052	182.686	6.499
221	7975	0.886	0.0061	146.114	6.575
222	8004	0.937	0.0056	165.935	7.242
223	8112	0.857	0.0060	143.444	7.161
224	8115	0.906	0.0065	139.695	7.699
225	8145	0.927	0.0064	146.141	7.312
226	8153	0.936	0.0060	156.859	7.078
227	8169	0.844	0.0066	128.299	6.591
228	8195	0.798	0.0078	102.578	8.173
229	8208	0.922	0.0066	140.165	7.513
230	8228	0.948	0.0054	175.635	6.792
231	8239	0.795	0.0087	91.156	9.305
232	8265	0.860	0.0061	142.126	7.512
233	8289	0.809	0.0087	93.381	9.337
234	8315	0.831	0.0070	118.880	6.572
235	8329	0.873	0.0056	154.823	6.769
236	8333	0.803	0.0076	106.202	8.044
237	8334	0.876	0.0055	158.440	6.439
238	8342	0.830	0.0073	113.774	8.396
239	8378	0.796	0.0078	101.440	7.836
240	8384	0.809	0.0077	105.449	7.058
241	8439	0.854	0.0062	137.645	7.283
242	8505	0.843	0.0065	129.856	6.989
243	8535	0.836	0.0066	127.247	7.389
244	8551	0.874	0.0056	156.707	6.656
245	8554	0.924	0.0064	144.285	7.512

246	8557	0.849	0.0063	135.572	7.220
247	8579	0.863	0.0062	138.936	7.538
248	8592	0.855	0.0061	140.941	6.832
249	8668	0.880	0.0053	165.345	6.739
250	8692	0.849	0.0067	127.234	6.202
251	8722	0.852	0.0063	135.290	6.699
252	8743	0.803	0.0083	97.190	8.994
253	8806	0.848	0.0062	137.153	7.279
254	8909	0.815	0.0073	112.412	7.364
255	8938	0.852	0.0061	139.557	7.356
256	8941	0.839	0.0073	114.308	5.990
257	8942	0.931	0.0062	151.409	7.268
258	8964	0.834	0.0069	121.374	8.007
259	8965	0.851	0.0062	137.151	7.099
260	9035	0.956	0.0051	189.078	6.524
261	9056	0.835	0.0068	123.239	7.705
262	9090	0.844	0.0066	128.874	6.723
263	9098	0.876	0.0058	151.330	7.215
264	9110	0.871	0.0056	156.737	7.020
265	9112	0.791	0.0081	98.292	7.482
266	9114	0.793	0.0081	97.625	8.648
267	9210	0.775	0.0088	88.531	8.353
268	9221	0.836	0.0070	119.585	6.342
269	9240	0.817	0.0084	97.432	9.169
270	9242	0.866	0.0061	143.094	7.274
271	9263	0.836	0.0067	125.294	7.344
272	9270	0.873	0.0059	146.795	7.358
273	9303	0.763	0.0093	81.849	7.249
274	9322	0.810	0.0074	108.841	7.317
275	9443	0.825	0.0071	116.448	6.906
276	9486	0.793	0.0083	95.028	8.937
277	9522	0.863	0.0061	141.651	7.379
278	9524	0.815	0.0080	101.945	8.882
279	9562	0.936	0.0058	162.447	7.134
280	9567	0.941	0.0057	166.212	6.993
281	9589	0.799	0.0088	90.661	9.400
282	9605	0.923	0.0065	142.954	7.539
283	9607	0.935	0.0060	156.343	7.091
284	9696	0.812	0.0074	109.232	7.622
285	9705	0.914	0.0044	205.800	6.372
286	9749	0.943	0.0056	168.562	6.896
287	9775	0.956	0.0051	188.402	6.527
288	9779	0.825	0.0069	118.977	7.776
289	9792	0.919	0.0073	126.765	7.389
290	9807	0.797	0.0084	95.344	9.018
291	9809	0.924	0.0062	149.347	7.772
292	9810	0.848	0.0064	132.774	7.247
293	9863	0.938	0.0060	155.738	6.893
294	9865	0.933	0.0060	155.504	7.205
295	9875	0.858	0.0061	140.839	6.601
296	9879	0.817	0.0081	100.777	8.976
297	9882	0.928	0.0062	149.704	7.372
298	9913	0.952	0.0049	193.175	6.878
299	9917	0.843	0.0070	119.766	6.171
300	9961	0.831	0.0069	121.204	7.686

OCR

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	19	0.719	0.0094	76.642	8.049
2	104	0.776	0.0091	84.933	8.636
3	120	0.753	0.0126	59.978	9.797
4	164	0.769	0.0101	76.032	9.361
5	242	0.764	0.0112	68.479	9.703
6	341	0.777	0.0092	84.782	8.553
7	401	0.758	0.0110	69.070	9.751
8	415	0.757	0.0126	59.899	10.199
9	503	0.765	0.0111	68.749	9.716
10	614	0.775	0.0096	80.529	8.810
11	621	0.756	0.0125	60.495	9.999

12	686	0.749	0.0138	54.258	10.320
13	754	0.747	0.0100	74.795	9.163
14	779	0.771	0.0101	75.976	9.359
15	862	0.754	0.0119	63.375	10.190
16	877	0.764	0.0113	67.812	9.778
17	916	0.771	0.0109	70.684	9.734
18	952	0.768	0.0115	66.797	9.998
19	1245	0.756	0.0128	59.091	10.258
20	1309	0.772	0.0090	85.588	8.676
21	1364	0.768	0.0102	75.235	9.378
22	1374	0.776	0.0092	84.694	8.858
23	1423	0.775	0.0093	83.564	8.695
24	1485	0.762	0.0121	62.968	10.111
25	1607	0.738	0.0089	82.500	8.270
26	1684	0.760	0.0121	62.991	10.002
27	1747	0.781	0.0100	77.986	9.225
28	1749	0.769	0.0113	68.077	9.894
29	1803	0.749	0.0136	55.045	10.336
30	1872	0.750	0.0127	59.161	9.697
31	1913	0.774	0.0094	82.853	8.939
32	2033	0.771	0.0106	72.930	9.574
33	2169	0.754	0.0131	57.718	10.275
34	2173	0.773	0.0092	84.181	8.817
35	2283	0.737	0.0099	74.739	8.261
36	2371	0.778	0.0096	80.715	9.100
37	2375	0.756	0.0103	73.476	9.222
38	2444	0.775	0.0124	62.632	10.209
39	2467	0.802	0.0091	87.747	8.220
40	2501	0.765	0.0102	74.665	8.552
41	2587	0.783	0.0107	72.910	9.597
42	2594	0.750	0.0092	81.145	8.781
43	2687	0.766	0.0110	69.582	9.700
44	2814	0.754	0.0086	87.245	7.925
45	2823	0.793	0.0123	64.387	9.669
46	3033	0.773	0.0090	86.314	8.607
47	3084	0.757	0.0087	87.452	8.280
48	3246	0.739	0.0092	80.311	8.394
49	3304	0.742	0.0148	50.130	10.309
50	3346	0.801	0.0105	76.628	9.280
51	3358	0.763	0.0113	67.314	9.806
52	3359	0.758	0.0102	74.473	9.312
53	3361	0.732	0.0097	75.234	8.838
54	3364	0.745	0.0142	52.567	10.196
55	3394	0.770	0.0104	74.188	9.486
56	3411	0.772	0.0108	71.631	9.704
57	3437	0.754	0.0106	71.283	9.428
58	3593	0.731	0.0094	78.213	8.459
59	3606	0.769	0.0090	85.279	8.636
60	3702	0.773	0.0102	75.942	9.392
61	3709	0.776	0.0109	71.117	9.438
62	3725	0.757	0.0127	59.444	10.239
63	3753	0.775	0.0104	74.931	9.478
64	3821	0.767	0.0092	83.227	8.858
65	3908	0.736	0.0123	60.080	10.178
66	3921	0.767	0.0093	82.556	8.786
67	3940	0.763	0.0082	92.613	7.931
68	3972	0.730	0.0098	74.535	8.877
69	4166	0.749	0.0087	86.215	8.332
70	4183	0.746	0.0100	74.397	9.115
71	4255	0.765	0.0088	87.296	8.581
72	4270	0.756	0.0124	60.906	9.954
73	4347	0.742	0.0087	85.781	8.192
74	4439	0.769	0.0113	68.165	9.901
75	4453	0.753	0.0125	60.412	9.840
76	4537	0.737	0.0101	73.122	9.017
77	4538	0.727	0.0105	69.564	8.793
78	4542	0.763	0.0111	68.813	9.600
79	4756	0.756	0.0120	63.055	9.872
80	4873	0.747	0.0092	81.106	8.035
81	4920	0.754	0.0089	84.822	8.495

82	4945	0.774	0.0105	73.590	9.566
83	4970	0.769	0.0100	77.118	9.230
84	5057	0.766	0.0114	67.516	9.854
85	5087	0.760	0.0120	63.311	9.948
86	5096	0.765	0.0118	64.645	10.072
87	5106	0.718	0.0107	67.325	9.110
88	5182	0.770	0.0105	73.520	9.503
89	5204	0.763	0.0113	67.397	9.741
90	5255	0.763	0.0098	77.658	9.200
91	5279	0.768	0.0091	84.436	8.030
92	5284	0.775	0.0101	76.962	9.345
93	5296	0.750	0.0134	55.889	10.090
94	5341	0.806	0.0093	86.284	8.676
95	5413	0.769	0.0084	91.619	8.349
96	5507	0.770	0.0111	69.514	9.757
97	5566	0.732	0.0090	81.146	8.376
98	5590	0.778	0.0107	72.650	9.638
99	5604	0.749	0.0089	84.617	8.307
100	5683	0.733	0.0086	84.918	8.122
101	5697	0.756	0.0124	60.794	10.038
102	5708	0.760	0.0114	66.417	9.661
103	5757	0.759	0.0085	89.658	7.911
104	5837	0.767	0.0107	71.743	9.518
105	5865	0.778	0.0110	70.768	9.777
106	5909	0.769	0.0109	70.614	9.678
107	5921	0.771	0.0086	90.196	8.440
108	5997	0.754	0.0126	59.918	9.966
109	6048	0.766	0.0092	83.584	7.175
110	6078	0.759	0.0116	65.359	10.133
111	6083	0.757	0.0093	81.193	8.399
112	6088	0.765	0.0087	88.469	8.521
113	6098	0.751	0.0094	79.977	8.642
114	6104	0.758	0.0118	64.348	9.698
115	6218	0.747	0.0080	93.698	7.806
116	6266	0.765	0.0121	63.124	10.251
117	6282	0.753	0.0103	73.039	9.200
118	6306	0.735	0.0100	73.853	8.949
119	6343	0.769	0.0086	89.805	8.193
120	6391	0.762	0.0077	98.506	7.844
121	6499	0.759	0.0086	88.464	7.963
122	6543	0.753	0.0093	81.229	8.319
123	6549	0.751	0.0136	55.321	10.327
124	6550	0.713	0.0106	66.965	8.010
125	6556	0.781	0.0089	87.766	8.188
126	6571	0.771	0.0107	72.204	9.352
127	6594	0.786	0.0104	75.454	9.294
128	6643	0.776	0.0110	70.354	9.815
129	6655	0.739	0.0097	76.165	8.857
130	6664	0.764	0.0103	74.037	9.104
131	6744	0.777	0.0092	84.261	8.897
132	6745	0.775	0.0093	83.274	8.928
133	6755	0.735	0.0153	48.101	10.781
134	6792	0.747	0.0099	75.506	8.446
135	6838	0.777	0.0104	74.868	9.491
136	6989	0.741	0.0102	72.777	9.250
137	6994	0.712	0.0109	65.076	9.143
138	7010	0.781	0.0094	83.431	8.961
139	7051	0.739	0.0097	76.545	8.145
140	7069	0.768	0.0101	76.242	9.289
141	7073	0.771	0.0117	65.947	10.141
142	7093	0.720	0.0097	74.513	8.131
143	7100	0.762	0.0087	87.550	8.512
144	7123	0.759	0.0099	76.654	9.226
145	7126	0.762	0.0091	84.202	8.733
146	7127	0.734	0.0097	75.321	8.332
147	7192	0.764	0.0092	82.878	8.783
148	7271	0.772	0.0107	72.011	9.643
149	7314	0.752	0.0113	66.600	9.749
150	7346	0.769	0.0107	71.613	9.607
151	7418	0.764	0.0116	66.100	9.964

152	7422	0.772	0.0109	71.131	9.744
153	7444	0.766	0.0106	72.433	9.454
154	7450	0.770	0.0102	75.823	9.290
155	7463	0.761	0.0097	78.642	8.860
156	7480	0.737	0.0081	90.666	7.423
157	7564	0.746	0.0094	79.244	8.791
158	7583	0.734	0.0092	79.755	8.413
159	7603	0.750	0.0086	87.064	8.208
160	7606	0.779	0.0091	85.768	8.665
161	7626	0.734	0.0093	78.591	8.336
162	7637	0.775	0.0090	86.132	8.576
163	7655	0.759	0.0125	60.940	10.180
164	7689	0.755	0.0109	69.131	9.643
165	7791	0.764	0.0103	74.382	9.165
166	7800	0.781	0.0106	73.603	9.535
167	7865	0.736	0.0087	84.515	8.193
168	7897	0.771	0.0108	71.626	9.658
169	7914	0.729	0.0091	80.566	8.339
170	8112	0.776	0.0094	83.008	8.851
171	8115	0.765	0.0088	87.352	8.582
172	8169	0.736	0.0089	82.721	8.272
173	8195	0.763	0.0119	64.265	10.012
174	8228	0.747	0.0084	88.654	8.281
175	8239	0.748	0.0140	53.382	10.508
176	8265	0.781	0.0093	84.110	8.860
177	8289	0.752	0.0133	56.775	10.278
178	8329	0.758	0.0089	84.996	8.644
179	8333	0.770	0.0117	66.033	10.111
180	8334	0.740	0.0100	74.097	8.002
181	8342	0.771	0.0108	71.168	9.731
182	8378	0.730	0.0116	62.903	9.913
183	8384	0.741	0.0097	76.503	8.418
184	8421	0.792	0.0132	60.223	10.208
185	8439	0.756	0.0091	83.407	8.686
186	8505	0.804	0.0095	84.648	8.788
187	8535	0.761	0.0091	83.325	8.721
188	8551	0.753	0.0076	98.572	7.723
189	8554	0.734	0.0093	78.713	8.171
190	8579	0.765	0.0089	85.988	8.672
191	8592	0.775	0.0091	84.907	8.343
192	8668	0.784	0.0087	89.700	8.537
193	8692	0.766	0.0105	72.809	8.253
194	8722	0.744	0.0092	81.182	8.178
195	8743	0.756	0.0123	61.574	9.977
196	8806	0.772	0.0097	79.837	8.880
197	8909	0.781	0.0101	77.194	9.330
198	8938	0.778	0.0092	84.604	8.879
199	8941	0.769	0.0090	85.494	8.700
200	8942	0.717	0.0097	73.854	7.878
201	8964	0.765	0.0109	70.043	9.575
202	8965	0.771	0.0084	91.921	8.308
203	9056	0.755	0.0098	77.306	8.929
204	9090	0.746	0.0086	86.371	8.286
205	9098	0.739	0.0090	82.556	8.456
206	9110	0.779	0.0085	91.444	8.470
207	9112	0.774	0.0113	68.657	9.918
208	9114	0.754	0.0131	57.611	10.252
209	9210	0.756	0.0118	64.045	10.186
210	9240	0.752	0.0127	59.107	10.073
211	9242	0.760	0.0082	92.831	8.066
212	9263	0.749	0.0096	78.487	8.956
213	9303	0.775	0.0107	72.434	9.663
214	9322	0.757	0.0096	79.116	8.927
215	9443	0.728	0.0097	75.282	8.280
216	9486	0.759	0.0129	59.098	10.447
217	9522	0.766	0.0096	79.590	9.082
218	9524	0.752	0.0134	55.943	10.348
219	9562	0.753	0.0077	97.905	7.619
220	9589	0.783	0.0145	53.962	10.720
221	9605	0.726	0.0090	80.711	8.170

222	9666	0.744	0.0094	79.438	8.244
223	9696	0.735	0.0099	74.077	9.000
224	9705	0.757	0.0097	78.441	8.042
225	9749	0.758	0.0074	102.038	7.444
226	9779	0.770	0.0100	77.440	9.253
227	9807	0.765	0.0132	58.023	10.202
228	9810	0.745	0.0085	88.169	8.241
229	9865	0.732	0.0087	84.648	7.917
230	9875	0.747	0.0085	88.216	7.924
231	9879	0.760	0.0113	67.121	9.583
232	9882	0.741	0.0094	78.854	7.872
233	9917	0.735	0.0103	71.139	8.271
234	9961	0.749	0.0106	70.962	9.053

BCS

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	19	0.894	0.0070	126.969	8.860
2	26	0.934	0.0084	111.468	9.640
3	104	0.927	0.0076	122.106	9.379
4	120	0.931	0.0093	100.412	10.453
5	164	0.947	0.0084	112.844	10.411
6	242	0.938	0.0085	111.081	10.366
7	336	0.853	0.0067	127.977	7.675
8	341	0.933	0.0078	119.655	9.663
9	401	0.955	0.0092	103.893	10.977
10	415	0.954	0.0097	98.390	11.135
11	503	0.943	0.0087	108.885	10.534
12	523	0.889	0.0070	126.161	8.803
13	614	0.938	0.0081	115.536	9.789
14	621	0.942	0.0092	102.705	10.696
15	659	0.900	0.0074	121.492	8.486
16	686	0.945	0.0102	93.102	11.032
17	754	0.947	0.0088	107.851	10.573
18	779	0.924	0.0077	119.866	9.615
19	829	0.867	0.0055	159.089	7.815
20	862	0.963	0.0095	101.323	11.252
21	877	0.945	0.0089	106.518	10.645
22	916	0.941	0.0083	113.766	10.218
23	952	0.955	0.0091	104.513	10.904
24	1225	0.883	0.0060	147.127	8.414
25	1245	0.956	0.0103	93.070	11.324
26	1309	0.935	0.0078	119.625	9.960
27	1364	0.951	0.0086	110.989	10.491
28	1374	0.925	0.0074	124.786	9.688
29	1423	0.934	0.0078	119.156	9.730
30	1484	0.881	0.0056	156.314	8.141
31	1485	0.953	0.0094	101.650	10.997
32	1607	0.920	0.0075	123.472	9.458
33	1684	0.960	0.0103	92.898	11.459
34	1747	0.940	0.0081	115.815	9.930
35	1749	0.949	0.0088	108.279	10.655
36	1803	0.951	0.0106	89.364	11.284
37	1872	0.924	0.0093	99.107	10.285
38	1913	0.929	0.0078	119.138	9.944
39	2007	0.901	0.0065	138.868	8.698
40	2033	0.943	0.0083	113.908	10.335
41	2169	0.957	0.0106	90.497	11.414
42	2173	0.918	0.0072	127.076	9.527
43	2283	0.933	0.0081	115.842	9.861
44	2371	0.932	0.0076	121.869	9.783
45	2375	0.953	0.0088	108.486	10.499
46	2386	0.893	0.0065	138.310	8.752
47	2390	0.891	0.0069	128.943	8.809
48	2444	0.952	0.0092	103.729	10.894
49	2467	0.926	0.0077	120.191	9.400
50	2501	0.938	0.0087	107.867	9.530
51	2587	0.937	0.0080	116.579	10.137
52	2594	0.932	0.0079	117.384	10.080
53	2687	0.957	0.0097	98.995	11.168

54	2814	0.907	0.0067	135.325	8.752
55	2823	0.935	0.0092	102.219	10.532
56	3033	0.928	0.0075	123.441	9.610
57	3084	0.926	0.0075	123.104	9.680
58	3246	0.911	0.0074	123.367	8.860
59	3304	0.946	0.0115	82.579	11.286
60	3329	0.862	0.0072	119.257	8.060
61	3346	0.929	0.0075	123.648	9.676
62	3358	0.941	0.0086	109.378	10.472
63	3359	0.939	0.0084	112.335	10.397
64	3361	0.937	0.0083	112.825	10.243
65	3364	0.943	0.0111	85.075	11.186
66	3394	0.934	0.0079	117.859	10.053
67	3411	0.949	0.0087	109.608	10.580
68	3437	0.945	0.0090	104.523	10.767
69	3593	0.922	0.0076	120.713	9.570
70	3606	0.904	0.0065	140.101	8.588
71	3702	0.942	0.0084	111.975	10.396
72	3709	0.955	0.0092	104.293	10.281
73	3725	0.954	0.0100	95.213	11.202
74	3753	0.949	0.0087	109.250	10.601
75	3782	0.852	0.0076	112.383	7.586
76	3821	0.933	0.0078	119.875	9.985
77	3908	0.954	0.0096	99.124	11.085
78	3921	0.937	0.0084	111.286	10.082
79	3923	0.915	0.0075	121.997	8.797
80	3940	0.910	0.0067	136.263	8.965
81	3972	0.933	0.0081	115.061	10.086
82	3997	0.915	0.0074	123.366	8.880
83	4166	0.910	0.0072	126.532	9.043
84	4183	0.924	0.0076	121.810	9.804
85	4255	0.919	0.0071	129.770	9.398
86	4256	0.876	0.0073	120.242	8.470
87	4270	0.943	0.0097	97.439	10.853
88	4278	0.884	0.0063	140.840	8.452
89	4284	0.870	0.0069	126.708	8.251
90	4347	0.910	0.0067	134.926	9.160
91	4384	0.885	0.0064	138.236	8.454
92	4385	0.868	0.0055	157.292	7.816
93	4439	0.947	0.0085	110.897	10.495
94	4453	0.932	0.0091	101.971	10.452
95	4537	0.944	0.0085	110.935	10.282
96	4538	0.943	0.0088	107.505	10.290
97	4542	0.940	0.0089	105.397	10.581
98	4653	0.855	0.0064	132.864	7.583
99	4756	0.939	0.0090	104.259	10.580
100	4818	0.937	0.0080	117.733	9.899
101	4834	0.873	0.0068	129.132	8.306
102	4873	0.912	0.0076	119.568	8.817
103	4920	0.923	0.0075	123.377	9.474
104	4937	0.885	0.0057	155.510	8.040
105	4945	0.949	0.0086	110.076	10.551
106	4970	0.923	0.0074	124.764	9.671
107	5057	0.952	0.0092	102.978	10.906
108	5066	0.941	0.0084	111.996	10.130
109	5087	0.945	0.0093	101.221	10.809
110	5096	0.950	0.0095	99.950	10.776
111	5106	0.941	0.0088	107.166	10.486
112	5113	0.909	0.0088	103.544	9.821
113	5182	0.947	0.0087	109.204	10.617
114	5204	0.945	0.0092	103.332	10.748
115	5255	0.932	0.0077	121.242	9.851
116	5279	0.923	0.0076	121.224	9.194
117	5284	0.940	0.0082	115.030	10.233
118	5296	0.937	0.0104	90.406	10.754
119	5341	0.912	0.0069	132.560	9.275
120	5413	0.918	0.0071	130.003	9.396
121	5417	0.872	0.0064	136.147	8.164
122	5438	0.913	0.0068	133.879	9.168
123	5507	0.964	0.0093	104.109	10.814

124	5525	0.876	0.0059	148.045	8.102
125	5563	0.880	0.0070	125.834	8.459
126	5566	0.914	0.0072	126.207	9.345
127	5573	0.910	0.0066	137.162	8.934
128	5590	0.950	0.0086	111.066	10.412
129	5604	0.918	0.0072	128.205	9.222
130	5656	0.885	0.0061	144.086	7.831
131	5683	0.897	0.0064	141.262	8.794
132	5697	0.946	0.0097	97.699	10.927
133	5708	0.934	0.0086	108.333	10.363
134	5757	0.891	0.0063	141.322	8.007
135	5837	0.941	0.0088	107.630	10.536
136	5865	0.954	0.0088	108.719	10.543
137	5909	0.945	0.0087	108.701	10.581
138	5921	0.908	0.0069	131.904	9.234
139	5997	0.939	0.0095	98.759	10.708
140	6048	0.905	0.0070	128.473	8.496
141	6063	0.874	0.0069	126.274	8.357
142	6078	0.962	0.0092	105.060	10.965
143	6083	0.919	0.0075	121.886	9.013
144	6088	0.924	0.0074	124.076	9.727
145	6098	0.915	0.0071	129.861	9.008
146	6104	0.933	0.0089	104.698	10.412
147	6218	0.904	0.0066	136.939	8.979
148	6266	0.960	0.0096	100.510	11.166
149	6282	0.935	0.0087	107.984	10.419
150	6306	0.940	0.0081	116.156	10.210
151	6332	0.959	0.0096	99.812	11.205
152	6343	0.919	0.0072	128.133	9.182
153	6391	0.904	0.0070	128.415	9.073
154	6499	0.916	0.0070	131.698	9.182
155	6543	0.895	0.0069	129.384	8.948
156	6549	0.948	0.0101	94.093	11.094
157	6550	0.865	0.0065	132.635	8.018
158	6556	0.917	0.0086	106.266	8.857
159	6557	0.938	0.0081	115.436	9.993
160	6571	0.921	0.0075	122.879	9.704
161	6594	0.947	0.0085	111.669	10.134
162	6635	0.886	0.0060	147.887	8.212
163	6643	0.957	0.0089	107.165	10.730
164	6655	0.918	0.0077	119.887	9.708
165	6664	0.920	0.0080	115.813	9.853
166	6737	0.910	0.0070	131.067	8.787
167	6744	0.934	0.0078	119.776	9.980
168	6745	0.924	0.0074	124.511	9.691
169	6755	0.951	0.0110	86.611	11.374
170	6761	0.938	0.0080	117.757	10.019
171	6792	0.931	0.0083	112.142	9.528
172	6838	0.942	0.0082	115.186	10.169
173	6971	0.895	0.0084	107.068	9.259
174	6989	0.933	0.0079	118.568	10.020
175	6994	0.928	0.0078	119.625	9.946
176	7044	0.907	0.0069	131.019	9.033
177	7049	0.872	0.0066	132.984	8.230
178	7051	0.923	0.0081	113.803	9.340
179	7069	0.949	0.0085	112.030	10.388
180	7073	0.959	0.0091	105.475	10.869
181	7093	0.887	0.0069	128.887	8.709
182	7100	0.921	0.0075	122.361	9.743
183	7123	0.947	0.0086	110.510	10.587
184	7126	0.929	0.0079	118.091	10.023
185	7127	0.915	0.0074	123.910	8.912
186	7192	0.908	0.0066	137.789	9.043
187	7198	0.866	0.0070	123.814	8.083
188	7271	0.943	0.0083	113.773	10.325
189	7314	0.951	0.0094	101.460	10.998
190	7418	0.951	0.0092	103.014	10.892
191	7422	0.947	0.0085	111.632	10.445
192	7444	0.936	0.0083	112.489	10.281
193	7450	0.932	0.0080	116.316	10.090

194	7463	0.928	0.0084	110.275	10.182
195	7480	0.874	0.0063	138.987	8.214
196	7564	0.927	0.0079	116.868	10.008
197	7583	0.929	0.0079	117.936	9.883
198	7603	0.916	0.0070	131.586	9.316
199	7606	0.907	0.0067	134.961	9.136
200	7626	0.917	0.0074	123.656	9.197
201	7637	0.925	0.0075	123.404	9.355
202	7655	0.956	0.0100	95.506	11.242
203	7689	0.951	0.0092	103.727	10.916
204	7791	0.925	0.0082	112.951	10.021
205	7794	0.871	0.0062	140.255	8.114
206	7800	0.952	0.0087	109.943	10.382
207	7807	0.902	0.0083	108.871	9.487
208	7865	0.898	0.0065	139.242	8.852
209	7897	0.947	0.0085	111.131	10.512
210	7914	0.917	0.0077	119.686	9.671
211	7942	0.841	0.0056	151.386	7.037
212	8004	0.890	0.0062	144.337	8.393
213	8112	0.927	0.0077	120.505	9.448
214	8115	0.913	0.0072	127.072	9.238
215	8145	0.872	0.0075	115.629	8.443
216	8153	0.872	0.0063	137.854	8.168
217	8195	0.957	0.0099	96.357	11.256
218	8208	0.885	0.0072	123.079	8.655
219	8228	0.889	0.0058	154.332	8.377
220	8239	0.951	0.0104	91.554	11.228
221	8265	0.922	0.0072	127.747	9.314
222	8289	0.950	0.0103	91.970	11.116
223	8329	0.916	0.0070	131.653	9.309
224	8333	0.959	0.0093	102.619	10.985
225	8334	0.914	0.0083	110.823	8.838
226	8342	0.946	0.0085	111.478	10.458
227	8378	0.964	0.0099	97.707	11.419
228	8384	0.947	0.0088	108.137	10.505
229	8421	0.936	0.0090	104.645	10.322
230	8439	0.922	0.0075	123.224	9.730
231	8505	0.939	0.0081	115.695	9.966
232	8535	0.924	0.0073	125.908	9.631
233	8551	0.899	0.0063	143.786	8.730
234	8554	0.884	0.0068	129.333	8.630
235	8579	0.924	0.0074	125.167	9.678
236	8592	0.923	0.0075	122.438	9.231
237	8668	0.892	0.0059	152.230	8.308
238	8692	0.926	0.0089	104.301	9.143
239	8722	0.926	0.0078	119.172	9.576
240	8743	0.945	0.0097	97.393	10.911
241	8806	0.928	0.0075	124.478	9.600
242	8909	0.944	0.0088	107.697	10.119
243	8938	0.920	0.0071	130.185	9.304
244	8941	0.927	0.0074	124.670	9.616
245	8942	0.879	0.0068	130.021	8.459
246	8964	0.942	0.0088	107.238	10.584
247	8965	0.926	0.0074	124.697	9.701
248	9056	0.930	0.0085	109.881	10.247
249	9090	0.920	0.0075	122.552	9.473
250	9098	0.912	0.0069	132.685	9.269
251	9110	0.920	0.0071	130.210	9.362
252	9112	0.968	0.0095	102.203	11.175
253	9114	0.954	0.0104	91.450	11.307
254	9210	0.958	0.0095	101.278	11.100
255	9221	0.924	0.0077	120.136	9.536
256	9240	0.958	0.0108	89.013	11.584
257	9242	0.921	0.0073	126.055	9.582
258	9263	0.930	0.0078	119.583	9.964
259	9270	0.927	0.0075	124.244	9.723
260	9303	0.953	0.0088	108.041	10.689
261	9322	0.931	0.0082	113.281	10.192
262	9443	0.920	0.0078	117.592	9.428
263	9486	0.957	0.0095	100.263	11.109

264	9522	0.933	0.0077	120.948	9.801
265	9524	0.952	0.0102	93.051	11.209
266	9562	0.889	0.0067	132.486	8.733
267	9589	0.954	0.0104	92.099	11.113
268	9605	0.891	0.0068	131.376	8.807
269	9607	0.894	0.0070	127.499	8.745
270	9653	0.876	0.0068	129.144	8.367
271	9666	0.916	0.0077	118.615	8.992
272	9696	0.940	0.0084	111.966	10.306
273	9698	0.906	0.0069	132.273	8.605
274	9705	0.914	0.0082	111.916	8.695
275	9749	0.890	0.0059	149.689	8.439
276	9775	0.854	0.0067	127.181	7.656
277	9779	0.933	0.0080	117.162	10.077
278	9807	0.946	0.0098	96.656	10.963
279	9809	0.853	0.0064	133.743	7.541
280	9810	0.914	0.0071	129.394	9.417
281	9865	0.891	0.0069	128.738	8.849
282	9875	0.907	0.0069	132.492	8.787
283	9879	0.925	0.0083	112.122	10.053
284	9882	0.909	0.0072	126.170	8.754
285	9913	0.887	0.0072	123.652	8.829
286	9917	0.927	0.0085	108.601	9.377
287	9961	0.926	0.0088	105.208	10.242

LSM

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	104	0.920	0.0032	288.438	8.524
2	120	0.918	0.0035	259.957	9.907
3	164	0.915	0.0033	276.471	9.365
4	242	0.914	0.0033	273.776	9.838
5	341	0.919	0.0033	281.747	8.620
6	401	0.911	0.0035	259.964	10.008
7	415	0.911	0.0035	262.828	9.910
8	503	0.910	0.0038	239.889	10.451
9	614	0.915	0.0035	262.796	9.035
10	621	0.916	0.0037	248.896	10.160
11	659	0.923	0.0028	335.599	8.409
12	686	0.907	0.0047	193.186	11.239
13	779	0.917	0.0031	295.897	9.409
14	862	0.907	0.0039	234.065	10.563
15	877	0.912	0.0036	251.318	10.240
16	916	0.910	0.0036	250.303	10.226
17	952	0.909	0.0037	245.524	10.321
18	1245	0.908	0.0041	219.502	10.824
19	1309	0.919	0.0031	298.690	8.886
20	1364	0.914	0.0034	269.327	9.244
21	1374	0.916	0.0032	289.790	9.454
22	1423	0.918	0.0033	281.288	8.784
23	1484	0.932	0.0022	427.292	7.931
24	1485	0.909	0.0040	229.765	10.666
25	1607	0.916	0.0029	312.045	8.710
26	1684	0.911	0.0037	244.651	10.349
27	1747	0.916	0.0035	264.399	9.124
28	1749	0.909	0.0037	245.512	10.333
29	1803	0.910	0.0042	214.544	10.794
30	1872	0.915	0.0041	223.460	10.362
31	1913	0.919	0.0031	301.219	9.309
32	1940	0.926	0.0027	347.693	7.936
33	2007	0.915	0.0038	241.222	10.300
34	2033	0.913	0.0034	270.664	9.768
35	2169	0.910	0.0041	221.094	10.762
36	2173	0.922	0.0027	337.915	8.850
37	2283	0.915	0.0032	285.970	8.645
38	2371	0.915	0.0033	281.089	9.532
39	2375	0.913	0.0035	257.719	8.889
40	2444	0.907	0.0042	214.334	10.986
41	2467	0.919	0.0033	279.015	8.539
42	2501	0.914	0.0038	241.793	8.936

43	2587	0.914	0.0033	275.041	9.752
44	2594	0.920	0.0028	327.237	8.557
45	2687	0.913	0.0038	243.769	10.327
46	2789	0.916	0.0032	287.932	8.425
47	2823	0.914	0.0038	238.809	10.334
48	3033	0.919	0.0031	298.927	8.746
49	3246	0.917	0.0031	293.329	8.371
50	3304	0.910	0.0049	184.851	11.175
51	3346	0.916	0.0032	289.814	9.404
52	3358	0.912	0.0036	256.523	10.142
53	3359	0.915	0.0032	283.207	9.614
54	3361	0.914	0.0031	295.991	8.988
55	3364	0.908	0.0048	190.289	11.101
56	3394	0.915	0.0033	281.749	9.669
57	3411	0.909	0.0037	243.516	10.360
58	3437	0.914	0.0032	284.699	9.605
59	3593	0.919	0.0029	313.644	8.289
60	3606	0.919	0.0029	315.767	9.011
61	3702	0.917	0.0031	297.874	9.252
62	3709	0.912	0.0040	230.433	9.148
63	3725	0.913	0.0036	255.862	10.147
64	3753	0.910	0.0037	247.522	10.277
65	3821	0.920	0.0031	300.726	9.017
66	3908	0.915	0.0033	280.053	9.700
67	3921	0.917	0.0032	289.444	9.056
68	3923	0.924	0.0034	274.979	7.873
69	3940	0.924	0.0027	340.672	8.200
70	3972	0.913	0.0032	288.116	9.232
71	3997	0.919	0.0030	307.477	8.201
72	4166	0.923	0.0027	345.646	8.466
73	4183	0.921	0.0027	339.705	8.589
74	4255	0.921	0.0028	328.710	8.634
75	4270	0.913	0.0037	243.968	10.302
76	4347	0.924	0.0026	352.418	8.562
77	4439	0.909	0.0037	243.233	10.377
78	4453	0.916	0.0036	251.330	10.055
79	4537	0.911	0.0034	271.825	9.099
80	4538	0.913	0.0034	266.533	8.760
81	4542	0.913	0.0037	250.230	10.231
82	4653	0.928	0.0039	236.122	9.352
83	4756	0.913	0.0037	244.627	10.287
84	4818	0.918	0.0033	277.220	9.072
85	4920	0.922	0.0028	335.432	8.550
86	4937	0.931	0.0026	354.015	8.251
87	4945	0.913	0.0034	267.235	9.765
88	4970	0.918	0.0030	302.879	9.234
89	5057	0.912	0.0035	258.534	10.095
90	5066	0.911	0.0034	268.831	9.180
91	5087	0.911	0.0037	247.206	10.303
92	5096	0.909	0.0040	228.480	10.683
93	5106	0.913	0.0033	277.674	9.180
94	5113	0.933	0.0019	497.171	7.284
95	5182	0.913	0.0034	269.190	9.893
96	5204	0.913	0.0035	263.707	10.012
97	5255	0.919	0.0030	302.503	8.789
98	5279	0.919	0.0033	282.699	8.263
99	5284	0.914	0.0033	276.768	9.653
100	5296	0.911	0.0044	206.126	10.851
101	5341	0.928	0.0027	340.169	8.368
102	5413	0.923	0.0028	335.680	8.426
103	5438	0.923	0.0027	338.052	8.475
104	5507	0.909	0.0039	232.302	9.989
105	5566	0.920	0.0027	335.649	8.287
106	5573	0.925	0.0027	341.018	8.543
107	5590	0.910	0.0036	250.119	10.006
108	5656	0.930	0.0028	334.970	7.017
109	5683	0.927	0.0024	384.784	8.079
110	5697	0.911	0.0040	228.165	10.599
111	5708	0.912	0.0038	238.158	10.387
112	5757	0.920	0.0029	314.535	8.134

113	5837	0.913	0.0035	258.136	10.111
114	5865	0.911	0.0038	242.718	10.036
115	5909	0.913	0.0034	266.122	9.943
116	5921	0.923	0.0027	336.849	8.954
117	5997	0.913	0.0041	225.302	10.563
118	6048	0.924	0.0031	303.287	7.870
119	6078	0.908	0.0038	237.468	10.250
120	6083	0.921	0.0032	285.372	8.321
121	6088	0.918	0.0029	315.559	8.989
122	6098	0.920	0.0030	303.499	8.592
123	6104	0.915	0.0036	255.779	10.058
124	6218	0.923	0.0026	358.847	8.342
125	6266	0.907	0.0039	230.335	10.667
126	6282	0.917	0.0032	284.204	9.631
127	6306	0.918	0.0031	298.713	8.844
128	6332	0.910	0.0036	252.717	10.106
129	6343	0.918	0.0030	301.925	8.249
130	6391	0.928	0.0024	381.243	7.867
131	6499	0.922	0.0028	324.835	8.445
132	6543	0.927	0.0026	353.169	8.553
133	6549	0.911	0.0041	223.494	10.641
134	6557	0.911	0.0034	269.008	9.094
135	6571	0.920	0.0031	296.878	9.435
136	6594	0.911	0.0037	249.222	9.715
137	6635	0.927	0.0024	383.100	8.193
138	6643	0.910	0.0039	231.925	10.458
139	6655	0.920	0.0027	344.746	8.506
140	6664	0.920	0.0031	301.375	9.367
141	6676	0.912	0.0040	228.308	9.203
142	6737	0.919	0.0030	307.232	8.492
143	6744	0.916	0.0031	292.171	9.485
144	6745	0.916	0.0031	298.658	9.177
145	6755	0.907	0.0049	186.718	11.358
146	6761	0.915	0.0031	292.432	8.683
147	6792	0.914	0.0035	262.845	8.497
148	6838	0.912	0.0035	261.686	9.843
149	6989	0.916	0.0032	284.417	9.572
150	6994	0.915	0.0031	300.521	8.955
151	7010	0.917	0.0031	294.835	9.212
152	7044	0.920	0.0027	341.861	8.254
153	7051	0.919	0.0033	282.683	7.914
154	7069	0.911	0.0035	259.371	9.092
155	7073	0.907	0.0039	232.212	10.515
156	7100	0.923	0.0026	350.699	8.539
157	7123	0.917	0.0032	288.043	9.067
158	7126	0.917	0.0029	311.883	9.039
159	7178	0.937	0.0020	467.220	7.520
160	7192	0.924	0.0026	356.634	8.430
161	7271	0.910	0.0037	248.436	10.205
162	7314	0.913	0.0035	260.363	10.035
163	7346	0.915	0.0033	277.002	9.739
164	7418	0.911	0.0037	244.932	10.357
165	7422	0.912	0.0035	261.100	9.911
166	7444	0.915	0.0034	270.406	9.896
167	7450	0.915	0.0033	275.231	9.816
168	7463	0.923	0.0028	332.629	8.959
169	7564	0.919	0.0028	328.048	8.890
170	7583	0.916	0.0030	309.220	8.623
171	7603	0.922	0.0027	336.600	8.556
172	7606	0.918	0.0032	286.836	9.588
173	7626	0.916	0.0030	302.008	8.606
174	7637	0.920	0.0032	290.811	8.455
175	7655	0.910	0.0039	231.951	10.598
176	7689	0.914	0.0034	272.309	9.813
177	7791	0.917	0.0033	281.706	9.671
178	7800	0.913	0.0035	257.900	9.395
179	7865	0.928	0.0024	379.915	8.445
180	7897	0.913	0.0034	265.315	9.839
181	7914	0.919	0.0027	339.254	8.507
182	8004	0.928	0.0024	389.451	7.890

183	8112	0.917	0.0032	286.454	9.040
184	8115	0.924	0.0027	341.586	8.674
185	8169	0.917	0.0028	325.437	8.615
186	8195	0.911	0.0037	249.429	10.277
187	8239	0.909	0.0043	210.710	10.913
188	8265	0.917	0.0032	286.137	9.262
189	8289	0.909	0.0041	222.441	10.725
190	8315	0.914	0.0033	278.938	8.741
191	8329	0.921	0.0028	326.590	8.815
192	8333	0.909	0.0037	242.990	10.118
193	8342	0.911	0.0035	257.595	10.031
194	8378	0.910	0.0034	267.549	9.673
195	8421	0.910	0.0041	224.087	10.745
196	8439	0.921	0.0028	334.565	8.754
197	8505	0.917	0.0034	271.183	9.342
198	8535	0.917	0.0031	293.915	9.500
199	8551	0.927	0.0025	375.453	8.180
200	8579	0.917	0.0029	318.452	8.732
201	8592	0.918	0.0032	286.345	8.767
202	8692	0.915	0.0040	228.254	8.690
203	8722	0.918	0.0031	293.439	8.148
204	8743	0.910	0.0041	224.176	10.658
205	8806	0.917	0.0033	275.373	8.965
206	8909	0.910	0.0036	254.556	9.493
207	8938	0.919	0.0030	309.868	9.055
208	8941	0.920	0.0030	310.766	8.646
209	8964	0.915	0.0034	273.271	9.849
210	8965	0.915	0.0031	298.407	9.178
211	9056	0.920	0.0030	308.233	9.257
212	9090	0.917	0.0029	312.402	8.514
213	9098	0.923	0.0027	348.143	8.621
214	9110	0.922	0.0027	342.362	8.722
215	9114	0.908	0.0044	208.631	10.995
216	9210	0.906	0.0040	224.712	10.798
217	9221	0.916	0.0031	299.322	8.582
218	9240	0.915	0.0041	225.640	10.521
219	9242	0.919	0.0028	324.785	8.795
220	9263	0.916	0.0030	304.625	9.169
221	9270	0.917	0.0029	313.874	8.610
222	9303	0.909	0.0037	247.265	10.209
223	9322	0.916	0.0031	301.361	9.342
224	9443	0.922	0.0028	332.008	8.893
225	9486	0.906	0.0042	216.568	10.972
226	9522	0.919	0.0031	298.503	8.706
227	9524	0.910	0.0041	221.804	10.706
228	9589	0.908	0.0046	198.115	11.287
229	9666	0.916	0.0032	286.592	8.419
230	9696	0.911	0.0032	282.216	9.274
231	9698	0.927	0.0029	315.130	8.115
232	9705	0.922	0.0033	284.018	8.156
233	9779	0.915	0.0033	281.229	9.700
234	9807	0.909	0.0042	215.774	10.832
235	9875	0.919	0.0028	324.304	8.400
236	9879	0.917	0.0034	271.524	9.816
237	9882	0.923	0.0030	310.616	7.985
238	9917	0.918	0.0036	252.481	7.941
239	9961	0.922	0.0029	314.783	9.118

FSM

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	19	0.927	0.0056	165.359	6.512
2	26	0.902	0.0068	133.282	7.536
3	104	0.904	0.0060	149.994	7.442
4	120	0.858	0.0071	120.663	7.981
5	164	0.865	0.0068	128.276	8.058
6	242	0.847	0.0074	114.466	8.416
7	341	0.919	0.0077	119.750	7.609
8	401	0.842	0.0079	106.846	8.958
9	415	0.821	0.0084	97.364	9.248

10	503	0.849	0.0073	116.108	8.536
11	614	0.895	0.0066	136.613	7.765
12	621	0.856	0.0071	120.729	8.345
13	686	0.804	0.0093	86.203	9.467
14	779	0.870	0.0066	131.478	8.146
15	862	0.826	0.0085	97.244	9.344
16	877	0.845	0.0077	110.273	8.858
17	916	0.857	0.0074	116.197	8.690
18	952	0.847	0.0076	112.005	8.789
19	1245	0.809	0.0089	91.022	9.410
20	1364	0.879	0.0073	120.199	8.283
21	1374	0.868	0.0066	130.723	8.134
22	1423	0.905	0.0062	147.144	7.465
23	1485	0.832	0.0080	103.688	8.964
24	1607	0.890	0.0065	136.850	7.616
25	1684	0.833	0.0080	104.542	9.014
26	1749	0.844	0.0079	106.785	9.009
27	1803	0.792	0.0100	79.153	9.360
28	1872	0.854	0.0074	114.907	8.157
29	1913	0.872	0.0067	130.063	8.182
30	2007	0.920	0.0102	90.476	6.270
31	2033	0.855	0.0078	109.983	8.580
32	2169	0.822	0.0085	97.156	9.343
33	2173	0.888	0.0059	151.518	7.555
34	2283	0.889	0.0063	141.501	7.493
35	2371	0.874	0.0065	134.912	8.040
36	2444	0.820	0.0085	96.421	9.293
37	2467	0.902	0.0066	136.555	7.438
38	2501	0.905	0.0073	123.850	7.808
39	2587	0.863	0.0069	124.923	8.299
40	2594	0.900	0.0053	169.916	7.066
41	2687	0.844	0.0075	112.831	8.632
42	2769	0.919	0.0068	135.610	7.158
43	2814	0.914	0.0056	163.899	6.712
44	2823	0.829	0.0081	102.731	8.992
45	3033	0.895	0.0063	143.113	7.650
46	3084	0.894	0.0078	114.608	8.019
47	3246	0.912	0.0062	147.666	7.177
48	3304	0.795	0.0097	82.174	9.633
49	3346	0.884	0.0062	142.497	7.891
50	3358	0.840	0.0077	109.179	8.837
51	3359	0.857	0.0072	119.075	8.438
52	3361	0.895	0.0068	131.304	7.625
53	3364	0.785	0.0099	79.199	9.985
54	3394	0.871	0.0067	129.672	8.208
55	3411	0.851	0.0077	109.961	8.874
56	3437	0.853	0.0072	117.910	8.289
57	3593	0.908	0.0063	144.941	7.210
58	3606	0.898	0.0058	155.046	7.498
59	3702	0.876	0.0063	139.360	7.868
60	3709	0.887	0.0073	120.817	8.154
61	3725	0.831	0.0081	103.243	9.049
62	3753	0.854	0.0077	110.413	8.849
63	3821	0.882	0.0063	140.960	7.332
64	3906	0.835	0.0079	105.915	8.953
65	3921	0.914	0.0073	125.767	7.771
66	3940	0.916	0.0058	158.240	7.097
67	3972	0.874	0.0070	123.996	8.056
68	3997	0.910	0.0071	129.071	7.395
69	4166	0.911	0.0062	147.088	7.097
70	4183	0.883	0.0062	141.967	7.696
71	4255	0.897	0.0056	159.036	7.231
72	4270	0.830	0.0081	102.755	8.767
73	4439	0.846	0.0081	105.055	9.069
74	4453	0.845	0.0076	111.594	8.297
75	4537	0.875	0.0069	126.595	8.106
76	4542	0.838	0.0077	108.168	8.778
77	4756	0.833	0.0080	104.676	8.971
78	4818	0.901	0.0055	164.068	7.373
79	4873	0.922	0.0075	122.493	7.282

80	4920	0.902	0.0060	151.148	7.358
81	4945	0.873	0.0065	133.468	8.091
82	4970	0.871	0.0065	133.366	7.884
83	5057	0.857	0.0075	113.719	8.731
84	5066	0.889	0.0069	128.577	7.802
85	5087	0.828	0.0082	101.354	9.103
86	5096	0.821	0.0084	97.565	9.196
87	5182	0.853	0.0072	119.245	8.453
88	5204	0.848	0.0073	115.485	8.447
89	5255	0.898	0.0059	152.428	7.441
90	5279	0.917	0.0062	146.874	7.066
91	5284	0.867	0.0077	113.126	8.656
92	5296	0.812	0.0088	92.265	9.364
93	5341	0.892	0.0062	144.583	7.401
94	5413	0.902	0.0060	150.810	7.201
95	5438	0.907	0.0060	151.944	7.103
96	5507	0.854	0.0087	98.663	9.114
97	5566	0.896	0.0061	146.452	7.351
98	5573	0.909	0.0055	166.706	7.295
99	5590	0.863	0.0075	115.922	8.627
100	5697	0.818	0.0087	94.652	8.957
101	5708	0.846	0.0075	113.546	8.476
102	5837	0.857	0.0071	119.972	8.497
103	5865	0.869	0.0080	108.269	8.739
104	5909	0.846	0.0074	114.420	8.512
105	5921	0.899	0.0055	164.288	7.316
106	5997	0.845	0.0075	113.305	8.523
107	6048	0.944	0.0057	167.069	6.461
108	6078	0.832	0.0081	102.218	9.080
109	6088	0.876	0.0065	134.708	7.856
110	6098	0.917	0.0057	161.171	6.834
111	6104	0.833	0.0080	104.186	8.717
112	6266	0.826	0.0085	97.479	9.396
113	6282	0.856	0.0071	120.908	8.194
114	6306	0.884	0.0065	135.436	7.866
115	6343	0.920	0.0060	153.969	7.144
116	6499	0.905	0.0057	158.866	7.275
117	6543	0.887	0.0062	143.917	7.112
118	*6549*	*0.811*	*0.0089*	*91.279*	*9.220*
119	6556	0.926	0.0073	126.510	7.096
120	6557	0.892	0.0077	116.666	7.991
121	6571	0.870	0.0065	134.232	7.913
122	6594	0.869	0.0069	126.483	8.305
123	6643	0.852	0.0076	112.862	8.772
124	6655	0.888	0.0061	145.900	7.208
125	6664	0.870	0.0065	134.176	7.771
126	6737	0.929	0.0073	127.434	7.305
127	6744	0.877	0.0064	137.932	7.939
128	6745	0.886	0.0059	149.780	7.555
129	6755	0.777	0.0102	75.895	10.312
130	6761	0.886	0.0061	145.775	7.368
131	6792	0.896	0.0065	138.444	7.535
132	6838	0.865	0.0071	122.340	8.437
133	6989	0.867	0.0068	126.788	8.288
134	6994	0.871	0.0067	129.512	8.094
135	7010	0.903	0.0063	142.926	7.716
136	7044	0.907	0.0061	149.122	7.212
137	7051	0.910	0.0061	149.580	7.134
138	7069	0.878	0.0085	103.166	8.538
139	7073	0.842	0.0080	105.498	9.062
140	7100	0.891	0.0059	151.886	7.224
141	7123	0.859	0.0070	122.594	8.183
142	7126	0.882	0.0062	142.734	7.564
143	7192	0.912	0.0052	176.337	6.952
144	7271	0.845	0.0074	113.570	8.557
145	7314	0.840	0.0077	108.903	8.493
146	7346	0.857	0.0073	117.721	8.591
147	7418	0.836	0.0079	106.544	8.942
148	7422	0.866	0.0069	126.221	8.312
149	7444	0.854	0.0071	119.673	8.455

150	7450	0.858	0.0070	123.487	8.263
151	7463	0.869	0.0066	132.174	7.927
152	7564	0.875	0.0064	135.790	7.706
153	7583	0.885	0.0064	137.354	7.621
154	7603	0.889	0.0066	134.214	7.671
155	7606	0.908	0.0057	159.254	7.417
156	7637	0.912	0.0061	149.811	7.326
157	7655	0.823	0.0085	97.214	9.347
158	7689	0.850	0.0074	115.715	8.205
159	7791	0.860	0.0076	112.972	7.620
160	7800	0.869	0.0067	130.571	8.164
161	7807	0.900	0.0061	148.242	7.202
162	7897	0.874	0.0074	118.332	8.461
163	7914	0.883	0.0067	131.789	7.503
164	8112	0.898	0.0057	157.142	7.516
165	8169	0.901	0.0062	145.698	7.412
166	8195	0.840	0.0080	105.530	9.054
167	8239	0.803	0.0092	87.755	9.582
168	8265	0.886	0.0061	145.393	7.714
169	8289	0.816	0.0087	93.504	9.201
170	8329	0.910	0.0055	164.235	7.319
171	8333	0.851	0.0080	106.983	8.962
172	8334	0.920	0.0058	160.046	6.946
173	8342	0.853	0.0072	118.413	8.437
174	8378	0.844	0.0079	106.547	8.819
175	8384	0.877	0.0075	116.344	8.172
176	8421	0.821	0.0088	93.632	9.607
177	8439	0.885	0.0062	143.811	7.619
178	8505	0.895	0.0063	141.440	7.826
179	8535	0.879	0.0066	132.508	8.092
180	8551	0.912	0.0054	169.753	7.033
181	8579	0.884	0.0061	145.354	7.512
182	8592	0.900	0.0059	152.876	7.424
183	8668	0.917	0.0051	178.689	7.061
184	8692	0.936	0.0064	145.465	7.123
185	8722	0.899	0.0061	146.787	7.330
186	8743	0.815	0.0087	94.179	9.317
187	8806	0.887	0.0061	145.368	7.772
188	8909	0.873	0.0071	122.816	8.372
189	8938	0.886	0.0061	146.049	7.744
190	8941	0.921	0.0061	150.635	7.178
191	8964	0.859	0.0070	123.637	8.329
192	9056	0.865	0.0068	126.488	8.154
193	9090	0.895	0.0064	140.343	7.470
194	9098	0.894	0.0059	151.076	7.327
195	9110	0.906	0.0055	164.535	7.277
196	9112	0.858	0.0083	103.640	8.727
197	9114	0.827	0.0083	100.128	9.234
198	9210	0.820	0.0085	96.955	9.266
199	9221	0.905	0.0066	136.631	7.414
200	9240	0.819	0.0086	95.737	9.059
201	9242	0.890	0.0059	150.141	7.349
202	9270	0.889	0.0061	146.657	7.426
203	9303	0.856	0.0082	104.979	8.980
204	9322	0.871	0.0073	119.966	8.373
205	9443	0.902	0.0064	140.016	7.767
206	9486	0.814	0.0087	93.096	9.484
207	9522	0.883	0.0062	142.589	7.471
208	9524	0.823	0.0083	98.692	9.184
209	9589	0.810	0.0091	89.398	9.742
210	9666	0.925	0.0065	142.670	7.133
211	9696	0.855	0.0075	114.277	8.417
212	9705	0.928	0.0059	158.214	6.729
213	9779	0.869	0.0068	127.683	8.304
214	9807	0.814	0.0087	93.507	9.394
215	9810	0.888	0.0059	150.456	7.609
216	9875	0.905	0.0059	153.170	7.191
217	9879	0.824	0.0083	99.248	8.991
218	9917	0.911	0.0066	137.192	7.189
219	9961	0.867	0.0067	128.872	8.173

Manual Parcels

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	26	0.491	0.0096	51.124	4.830
2	104	0.140	0.0129	10.912	6.318
3	120	0.614	0.0077	80.124	4.623
4	336	0.516	0.0086	59.840	4.838
5	341	0.413	0.0095	43.653	5.242
6	523	0.620	0.0090	68.737	4.331
7	614	0.354	0.0101	35.081	5.469
8	621	0.192	0.0122	15.720	6.138
9	659	0.814	0.0085	96.041	3.649
10	686	0.376	0.0106	35.594	5.591
11	754	0.452	0.0108	41.928	4.856
12	779	0.496	0.0086	57.477	5.037
13	916	0.879	0.0077	114.101	3.714
14	952	0.489	0.0087	56.196	5.065
15	1245	0.441	0.0092	47.791	5.254
16	1309	0.352	0.0101	34.738	5.486
17	1374	0.666	0.0082	81.446	4.572
18	1423	0.764	0.0074	102.622	3.958
19	1484	0.646	0.0081	79.984	4.322
20	1485	0.773	0.0074	105.008	4.124
21	1607	0.434	0.0099	43.647	5.066
22	1684	0.341	0.0105	32.561	5.648
23	1749	0.282	0.0113	25.032	5.880
24	1803	0.669	0.0083	81.053	4.540
25	1872	0.267	0.0115	23.225	5.940
26	1913	0.401	0.0097	41.268	5.413
27	1940	0.696	0.0076	91.834	4.332
28	2033	0.522	0.0088	59.132	4.759
29	2169	0.708	0.0088	80.596	4.329
30	2173	0.797	0.0070	114.616	3.956
31	2283	0.683	0.0090	75.907	4.084
32	2371	0.579	0.0079	73.208	4.713
33	2386	0.331	0.0104	31.768	5.524
34	2444	0.633	0.0075	83.929	4.556
35	2454	0.797	0.0080	99.429	3.971
36	2467	0.459	0.0106	43.362	4.852
37	2501	0.296	0.0108	27.541	5.699
38	2587	0.416	0.0107	38.795	5.533
39	2687	0.351	0.0111	31.674	5.733
40	2696	0.922	0.0096	95.643	3.176
41	2752	0.587	0.0082	71.774	4.607
42	2789	0.623	0.0090	69.030	4.321
43	2814	0.552	0.0084	65.557	4.694
44	2823	0.712	0.0074	96.207	4.139
45	3033	0.746	0.0099	75.240	3.771
46	3084	0.332	0.0105	31.682	5.511
47	3304	0.303	0.0125	24.319	5.985
48	3346	0.515	0.0085	60.931	4.964
49	3364	0.330	0.0116	28.574	5.836
50	3394	0.667	0.0079	84.156	4.539
51	3411	0.535	0.0084	63.682	4.801
52	3437	0.373	0.0105	35.389	5.597
53	3495	0.654	0.0081	81.067	4.291
54	3547	0.823	0.0080	102.493	3.867
55	3579	0.934	0.0084	111.103	3.428
56	3594	0.666	0.0084	79.731	4.485
57	3606	0.871	0.0074	118.238	3.583
58	3702	0.480	0.0088	54.541	5.101
59	3709	0.477	0.0090	52.865	5.149
60	3725	0.186	0.0131	14.130	6.331
61	3753	0.369	0.0106	34.808	5.632
62	3782	0.885	0.0076	116.814	3.506
63	3821	0.338	0.0103	32.893	5.539
64	3908	0.569	0.0080	71.335	4.751
65	3923	0.665	0.0080	82.811	4.249
66	3940	0.723	0.0081	89.622	4.017

67	3972	0.441	0.0102	43.234	4.986
68	3997	0.541	0.0085	63.622	4.725
69	4183	0.368	0.0099	37.019	5.407
70	4255	0.563	0.0083	68.023	4.659
71	4256	0.329	0.0112	29.500	5.404
72	4270	0.148	0.0133	11.173	6.408
73	4284	0.670	0.0080	83.428	4.231
74	4347	0.668	0.0081	82.430	4.472
75	4384	0.587	0.0082	71.309	4.557
76	4385	0.784	0.0082	95.172	3.777
77	4439	0.240	0.0120	20.035	5.764
78	4483	0.454	0.0092	49.139	5.040
79	4653	0.859	0.0071	121.460	3.834
80	4756	0.344	0.0104	32.933	5.638
81	4834	0.297	0.0108	27.441	5.659
82	4873	0.483	0.0093	52.216	4.939
83	4945	0.682	0.0080	85.568	4.525
84	4970	0.213	0.0123	17.370	6.152
85	5057	0.230	0.0121	19.053	6.088
86	5066	0.349	0.0111	31.599	5.315
87	5087	0.377	0.0100	37.640	5.508
88	5096	0.594	0.0078	76.199	4.653
89	5201	0.749	0.0085	88.300	3.871
90	5204	0.568	0.0081	69.878	4.691
91	5284	0.332	0.0104	31.841	5.618
92	5296	0.354	0.0103	34.301	5.599
93	5413	0.557	0.0084	66.452	4.672
94	5417	0.467	0.0093	50.238	4.966
95	5438	0.473	0.0089	52.847	5.009
96	5525	0.525	0.0087	60.098	4.758
97	5563	0.887	0.0088	100.607	3.376
98	5566	0.538	0.0093	57.932	4.856
99	5573	0.477	0.0093	51.434	5.188
100	5590	0.745	0.0103	72.256	3.745
101	5604	0.372	0.0100	37.269	5.357
102	5656	0.528	0.0086	61.737	4.787
103	5683	0.733	0.0082	89.717	3.965
104	5697	0.120	0.0143	8.417	6.605
105	5708	0.549	0.0081	67.376	4.831
106	5837	0.562	0.0091	61.613	4.961
107	5865	0.778	0.0072	107.873	3.928
108	5909	0.559	0.0091	61.399	4.973
109	5921	0.596	0.0103	58.063	4.310
110	5997	0.098	0.0141	6.956	6.607
111	6048	0.617	0.0081	75.823	4.435
112	6063	0.799	0.0083	96.486	3.723
113	6088	0.501	0.0087	57.394	4.893
114	6098	0.839	0.0102	81.979	3.419
115	6104	0.088	0.0142	6.195	6.646
116	6218	0.547	0.0087	63.244	4.669
117	6266	0.166	0.0130	12.751	6.339
118	6343	0.756	0.0076	100.180	4.111
119	6499	0.654	0.0081	81.320	4.292
120	6543	0.501	0.0087	57.402	4.897
121	6549	0.552	0.0089	61.810	4.988
122	6550	0.490	0.0088	55.586	4.937
123	6551	0.809	0.0074	109.277	3.812
124	6556	0.641	0.0084	76.112	4.583
125	6557	0.620	0.0081	76.685	4.452
126	6571	0.626	0.0076	82.494	4.527
127	6594	0.634	0.0075	83.972	4.497
128	6643	0.361	0.0102	35.281	5.576
129	6664	0.484	0.0088	55.269	5.085
130	6676	0.548	0.0086	63.845	4.677
131	6737	0.683	0.0075	91.656	4.299
132	6744	0.791	0.0075	104.999	3.843
133	6755	0.154	0.0141	10.888	6.515
134	6761	0.670	0.0081	83.023	4.225
135	6763	0.444	0.0092	48.491	5.135
136	6792	0.231	0.0120	19.230	5.866

137	6838	0.517	0.0097	53.332	5.136
138	6971	0.432	0.0109	39.727	4.936
139	6989	0.495	0.0104	47.424	4.709
140	6994	0.441	0.0092	47.781	5.131
141	7010	0.467	0.0090	51.929	5.027
142	7044	0.409	0.0101	40.413	5.162
143	7049	0.695	0.0093	75.113	4.017
144	7051	0.471	0.0097	48.695	4.921
145	7069	0.773	0.0078	99.198	3.850
146	7093	0.491	0.0095	51.918	4.849
147	7097	0.529	0.0084	62.830	4.970
148	7100	0.394	0.0097	40.770	5.318
149	7126	0.340	0.0103	33.165	5.528
150	7127	0.708	0.0088	80.760	4.005
151	7192	0.510	0.0086	59.530	4.895
152	7198	0.804	0.0089	90.268	3.636
153	7271	-0.154	0.0182	-8.457	7.598
154	*7314*	*0.264*	*0.0112*	*23.641*	*5.830*
155	7418	0.659	0.0077	85.250	4.546
156	7422	0.384	0.0114	33.741	5.680
157	7444	0.325	0.0107	30.425	5.711
158	7450	0.775	0.0082	94.690	3.818
159	7480	0.584	0.0080	73.051	4.717
160	7512	0.467	0.0091	51.189	4.986
161	*7564*	*0.372*	*0.0100*	*37.220*	*5.358*
162	7583	0.606	0.0091	66.877	4.389
163	7603	0.574	0.0082	70.297	4.782
164	7606	0.839	0.0073	114.886	3.866
165	7626	0.590	0.0091	64.833	4.452
166	7637	0.415	0.0095	43.894	5.232
167	7655	0.267	0.0115	23.228	5.940
168	7689	0.165	0.0125	13.154	6.222
169	7791	0.364	0.0102	35.694	5.560
170	7794	0.833	0.0113	73.719	3.368
171	7800	0.292	0.0112	26.129	5.844
172	7884	0.663	0.0082	81.289	4.494
173	7914	0.349	0.0107	32.705	5.398
174	7942	0.735	0.0084	87.705	3.933
175	8004	0.571	0.0080	71.286	4.740
176	8112	0.511	0.0087	58.943	4.855
177	8115	0.388	0.0097	39.858	5.343
178	8145	0.538	0.0086	62.773	4.730
179	8153	0.381	0.0099	38.554	5.331
180	8208	0.565	0.0084	67.538	4.634
181	8303	0.807	0.0080	100.724	3.929
182	8315	0.263	0.0120	21.973	5.624
183	8329	0.879	0.0101	86.934	3.291
184	8333	0.469	0.0102	46.134	5.331
185	8342	0.309	0.0109	28.324	5.775
186	8421	0.422	0.0099	42.645	5.424
187	8439	0.666	0.0082	81.626	4.223
188	8505	0.755	0.0074	102.233	4.096
189	8535	0.416	0.0110	37.771	5.486
190	8551	0.744	0.0074	100.537	4.045
191	8554	0.828	0.0110	75.552	3.409
192	8557	0.581	0.0083	70.397	4.580
193	8579	0.437	0.0093	47.212	5.146
194	8592	0.522	0.0086	60.816	4.809
195	8668	0.940	0.0078	120.215	3.361
196	8692	0.704	0.0080	87.620	4.098
197	8743	0.489	0.0101	48.530	5.304
198	8806	0.753	0.0071	106.007	4.157
199	8938	0.423	0.0095	44.756	5.327
200	8942	0.524	0.0087	60.459	4.782
201	8964	0.335	0.0106	31.725	5.673
202	8965	0.448	0.0092	48.860	5.104
203	9035	0.815	0.0074	109.904	3.786
204	*9056*	*0.307*	*0.0117*	*26.233*	*5.883*
205	9090	0.407	0.0103	39.681	5.151
206	9098	0.632	0.0081	78.018	4.376

207	9110	0.711	0.0073	98.166	4.190
208	9114	0.508	0.0092	55.364	5.135
209	9210	0.395	0.0112	35.405	5.618
210	9221	0.489	0.0097	50.452	4.828
211	9240	0.464	0.0090	51.747	5.163
212	9242	0.542	0.0102	53.038	4.536
213	9263	0.635	0.0083	76.178	4.326
214	9270	0.466	0.0090	51.793	5.031
215	9303	0.396	0.0098	40.447	5.434
216	9486	0.085	0.0143	5.932	6.659
217	9522	0.793	0.0107	73.883	3.546
218	9524	0.069	0.0145	4.776	6.720
219	9567	1.001	0.0092	108.514	2.953
220	9589	0.158	0.0131	12.081	6.368
221	9605	0.785	0.0083	94.976	3.771
222	9607	0.482	0.0090	53.501	4.927
223	9653	0.393	0.0104	37.935	5.205
224	9666	0.582	0.0093	62.563	4.460
225	9698	0.376	0.0099	37.864	5.345
226	9749	0.911	0.0090	100.841	3.276
227	9775	0.529	0.0085	61.984	4.786
228	9779	0.323	0.0107	30.109	5.720
229	9807	0.250	0.0121	20.636	6.071
230	9809	0.798	0.0072	111.462	4.012
231	9810	0.035	0.0144	2.429	6.672
232	9863	0.417	0.0100	41.901	5.146
233	9875	0.750	0.0105	71.388	3.716
234	9882	0.714	0.0076	94.633	4.129

Manual Priority

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	82	0.460	0.0089	51.772	6.178
2	120	0.461	0.0089	52.082	6.197
3	164	0.577	0.0080	72.062	5.628
4	242	0.407	0.0095	42.841	6.459
5	336	0.901	0.0081	111.611	4.166
6	341	0.774	0.0071	109.159	4.686
7	401	0.222	0.0118	18.851	7.321
8	415	0.291	0.0109	26.635	7.010
9	523	1.007	0.0083	121.208	3.667
10	621	0.449	0.0090	49.910	6.256
11	686	0.136	0.0131	10.399	7.753
12	754	0.218	0.0122	17.878	7.393
13	779	0.705	0.0068	104.116	5.033
14	877	0.444	0.0092	48.311	6.262
15	916	0.397	0.0106	37.441	6.570
16	952	0.359	0.0101	35.705	6.685
17	1245	0.367	0.0113	32.590	6.691
18	1309	0.659	0.0075	88.203	5.237
19	1364	0.465	0.0090	51.636	6.161
20	1374	0.678	0.0071	96.000	5.208
21	1423	0.973	0.0080	122.300	3.815
22	1485	0.306	0.0107	28.509	6.939
23	1607	0.682	0.0082	83.661	5.218
24	1684	0.319	0.0106	30.172	6.877
25	1749	0.380	0.0098	38.786	6.584
26	1803	0.242	0.0116	20.923	7.243
27	1872	0.569	0.0078	73.125	5.677
28	1913	0.792	0.0065	122.693	4.617
29	2007	0.385	0.0098	39.505	6.562
30	2033	0.499	0.0085	58.753	5.999
31	2169	0.359	0.0104	34.379	6.715
32	2283	0.731	0.0080	91.824	4.985
33	2371	0.784	0.0065	121.130	4.655
34	2375	0.421	0.0095	44.409	6.440
35	2386	1.006	0.0079	126.990	3.607
36	2444	0.519	0.0083	62.912	5.925
37	2467	0.458	0.0091	50.501	6.199
38	2501	0.581	0.0079	73.709	5.610

39	2587	0.447	0.0090	49.467	6.268
40	2687	0.625	0.0073	85.714	5.416
41	2789	0.978	0.0082	119.878	3.805
42	2823	0.235	0.0119	19.819	7.279
43	3033	0.971	0.0087	111.203	3.823
44	3304	0.260	0.0117	22.293	7.149
45	3346	0.474	0.0087	54.249	6.140
46	3358	0.379	0.0098	38.629	6.589
47	3359	0.428	0.0101	42.256	6.430
48	3364	0.070	0.0140	5.012	8.066
49	3394	0.483	0.0089	54.318	6.086
50	3411	0.507	0.0086	58.863	5.966
51	3437	0.460	0.0090	50.955	6.186
52	3495	0.954	0.0068	139.372	3.953
53	3606	0.917	0.0065	140.523	4.020
54	3702	0.739	0.0068	108.304	4.854
55	3709	0.511	0.0086	59.764	5.944
56	3725	0.393	0.0097	40.661	6.525
57	3753	0.562	0.0080	69.909	5.704
58	3821	0.544	0.0083	65.891	5.786
59	3908	0.490	0.0086	57.277	6.062
60	3921	0.576	0.0080	72.097	5.630
61	3923	1.107	0.0087	127.350	3.128
62	3940	0.853	0.0071	119.725	4.312
63	3972	0.586	0.0087	67.159	5.676
64	3997	0.778	0.0071	108.958	4.671
65	4166	0.674	0.0074	91.089	5.163
66	4255	0.964	0.0080	121.204	3.866
67	4256	0.863	0.0085	101.801	4.336
68	4270	0.517	0.0087	59.726	5.937
69	4347	0.952	0.0075	127.672	3.837
70	4385	1.158	0.0096	120.225	2.942
71	4439	0.482	0.0086	55.905	6.097
72	4453	0.450	0.0092	48.908	6.188
73	4537	0.746	0.0079	94.348	4.910
74	4542	0.568	0.0081	70.151	5.662
75	4756	0.254	0.0113	22.439	7.164
76	4818	0.804	0.0069	117.156	4.493
77	4834	0.855	0.0073	116.908	4.328
78	4873	0.916	0.0079	115.603	4.102
79	4920	0.761	0.0076	100.281	4.818
80	4970	0.431	0.0099	43.452	6.402
81	5057	0.467	0.0088	53.119	6.170
82	5087	0.323	0.0105	30.637	6.860
83	5096	0.381	0.0098	39.035	6.564
84	5106	0.411	0.0108	38.222	6.485
85	5182	0.521	0.0083	62.869	5.913
86	5284	0.684	0.0069	99.531	5.134
87	5296	0.129	0.0135	9.560	7.745
88	5417	1.071	0.0101	106.204	3.331
89	5438	0.939	0.0082	114.665	3.983
90	5507	0.543	0.0083	65.682	5.791
91	5566	0.902	0.0086	105.272	4.151
92	5590	0.848	0.0063	134.546	4.342
93	5604	0.754	0.0074	102.378	4.815
94	5697	0.379	0.0099	38.256	6.593
95	5708	0.462	0.0094	49.195	6.239
96	5757	0.631	0.0087	72.630	5.452
97	5837	0.590	0.0076	77.824	5.584
98	5865	0.514	0.0083	61.909	5.947
99	5909	0.395	0.0096	41.079	6.492
100	5921	0.838	0.0064	131.596	4.386
101	5997	0.429	0.0092	46.537	6.351
102	6088	0.488	0.0098	49.989	6.131
103	6098	1.007	0.0079	128.029	3.587
104	6104	0.382	0.0098	39.015	6.577
105	6218	0.964	0.0077	125.236	3.813
106	6266	0.441	0.0091	48.453	6.296
107	6282	0.408	0.0096	42.667	6.433
108	6499	0.959	0.0068	141.805	3.789

109	6549	0.305	0.0108	28.296	6.947
110	6557	0.767	0.0079	97.548	4.812
111	6571	0.495	0.0085	58.246	6.037
112	6594	0.626	0.0075	83.959	5.389
113	6643	0.493	0.0101	48.767	6.091
114	6655	0.576	0.0086	66.821	5.712
115	6664	0.653	0.0071	92.091	5.283
116	6676	0.463	0.0093	49.572	6.220
117	6737	0.866	0.0075	115.274	4.310
118	6744	0.574	0.0078	73.224	5.634
119	6745	0.608	0.0083	73.435	5.547
120	6755	0.324	0.0107	30.346	6.851
121	6761	0.726	0.0072	100.864	4.917
122	6763	0.264	0.0113	23.336	7.129
123	6989	0.576	0.0077	74.827	5.649
124	7044	1.062	0.0087	122.730	3.403
125	7049	1.006	0.0085	118.287	3.668
126	7051	0.888	0.0090	98.300	4.205
127	7093	0.885	0.0079	112.727	4.249
128	7097	1.007	0.0080	126.535	3.613
129	7100	0.634	0.0076	83.261	5.357
130	7126	0.652	0.0075	86.706	5.271
131	7271	0.180	0.0124	14.465	7.542
132	7314	0.521	0.0085	61.692	5.894
133	7346	0.438	0.0096	45.746	6.301
134	7418	0.423	0.0099	42.931	6.423
135	7422	0.351	0.0109	32.241	6.795
136	7444	0.367	0.0100	36.853	6.647
137	7450	0.493	0.0085	57.900	6.046
138	7463	0.655	0.0074	88.442	5.249
139	7480	0.739	0.0075	98.329	4.903
140	7564	0.748	0.0074	101.328	4.845
141	7583	0.506	0.0094	53.902	6.060
142	7603	0.615	0.0080	77.316	5.477
143	7655	0.228	0.0118	19.363	7.312
144	7689	0.481	0.0088	54.619	6.083
145	7791	0.712	0.0067	105.563	5.003
146	7897	0.257	0.0114	22.604	7.172
147	7914	0.750	0.0079	94.895	4.894
148	8112	0.840	0.0071	118.242	4.372
149	8153	0.924	0.0076	122.243	4.013
150	8169	0.963	0.0081	119.021	3.877
151	8195	0.364	0.0100	36.331	6.664
152	8239	0.079	0.0142	5.600	8.016
153	8289	0.220	0.0119	18.537	7.349
154	8315	0.645	0.0084	77.246	5.396
155	8333	0.404	0.0096	41.851	6.476
156	8334	0.775	0.0073	106.341	4.709
157	8342	0.482	0.0086	55.840	6.099
158	8378	0.343	0.0107	31.933	6.806
159	8421	0.162	0.0131	12.383	7.594
160	8535	0.790	0.0068	115.372	4.605
161	8554	0.698	0.0089	78.766	5.119
162	8579	0.541	0.0083	65.241	5.801
163	8722	0.880	0.0081	108.349	4.264
164	8743	0.218	0.0121	18.011	7.362
165	8806	0.545	0.0080	68.172	5.799
166	8909	0.825	0.0065	127.127	4.454
167	8941	0.813	0.0078	104.215	4.592
168	8942	0.857	0.0074	116.094	4.331
169	8964	0.623	0.0073	85.255	5.425
170	8965	0.706	0.0068	103.500	5.013
171	9056	0.678	0.0074	91.867	5.144
172	9090	0.856	0.0080	107.148	4.380
173	9098	0.813	0.0090	90.329	4.561
174	9110	0.847	0.0064	132.161	4.354
175	9114	0.412	0.0094	43.694	6.434
176	9210	0.170	0.0126	13.499	7.590
177	9221	0.827	0.0080	103.667	4.522
178	9240	0.289	0.0113	25.623	7.008

179	9242	0.858	0.0073	116.402	4.317
180	9263	0.732	0.0074	99.017	4.915
181	9270	0.834	0.0071	117.490	4.401
182	9303	0.315	0.0106	29.586	6.899
183	9486	0.334	0.0104	32.219	6.803
184	9522	0.650	0.0075	86.268	5.282
185	9524	0.121	0.0133	9.129	7.823
186	9562	0.911	0.0085	107.255	4.109
187	9589	0.016	0.0148	1.117	8.322
188	9607	0.791	0.0073	108.435	4.637
189	9666	1.008	0.0085	118.384	3.656
190	9696	0.677	0.0087	77.918	5.226
191	9698	0.790	0.0085	92.712	4.681
192	9749	0.974	0.0076	127.704	3.739
193	9779	0.728	0.0066	110.407	4.927
194	9807	0.268	0.0114	23.509	7.123
195	9809	0.826	0.0068	120.985	4.400
196	9863	0.784	0.0078	101.193	4.732
197	9865	0.892	0.0081	110.805	4.209
198	9875	0.883	0.0088	100.111	4.235
199	9879	0.332	0.0104	31.941	6.814
200	9917	0.718	0.0089	80.835	5.017
201	9961	0.633	0.0078	80.716	5.391

SPBS Non-Priority

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	120	0.555	0.0142	39.049	6.656
2	242	0.506	0.0152	33.382	6.899
3	415	0.510	0.0148	34.401	6.836
4	686	0.355	0.0182	19.461	7.629
5	1245	0.391	0.0169	23.112	7.218
6	1485	0.454	0.0161	28.215	7.140
7	1803	0.521	0.0148	35.105	6.820
8	1872	0.575	0.0137	41.833	6.528
9	2007	0.528	0.0184	28.747	7.062
10	2444	0.375	0.0182	20.666	7.558
11	2823	0.485	0.0156	31.075	7.005
12	3304	0.451	0.0158	28.618	6.917
13	3364	0.218	0.0220	9.949	8.333
14	3394	0.550	0.0147	37.339	6.382
15	3411	0.463	0.0161	28.835	7.113
16	3709	0.545	0.0141	38.536	6.650
17	3725	0.584	0.0150	39.001	6.638
18	3753	0.508	0.0148	34.387	6.830
19	4270	0.463	0.0155	29.855	6.859
20	4453	0.551	0.0150	36.618	6.364
21	4537	0.484	0.0152	31.918	6.751
22	4538	0.548	0.0153	35.852	6.367
23	4756	0.511	0.0145	35.188	6.671
24	5057	0.465	0.0153	30.361	6.948
25	5096	0.368	0.0183	20.174	7.589
26	5182	0.562	0.0141	39.858	6.623
27	5204	0.483	0.0156	30.901	7.013
28	5284	0.523	0.0148	35.478	6.801
29	5296	0.509	0.0151	33.792	6.879
30	5507	0.550	0.0152	36.152	6.771
31	5590	0.462	0.0161	28.755	7.117
32	5697	0.555	0.0142	39.173	6.644
33	5837	0.563	0.0141	40.041	6.612
34	6078	0.399	0.0168	23.737	7.345
35	6104	0.532	0.0147	36.258	6.772
36	6266	0.545	0.0144	37.805	6.706
37	6643	0.486	0.0155	31.287	6.994
38	6755	0.384	0.0175	21.863	7.482
39	6994	0.573	0.0137	41.958	6.508
40	7271	0.631	0.0129	48.775	6.285
41	7314	0.490	0.0174	28.145	7.133
42	7346	0.576	0.0151	38.265	6.227
43	7450	0.532	0.0164	32.391	6.919

44	7655	0.275	0.0192	14.363	7.728
45	7689	0.393	0.0169	23.254	7.205
46	7897	0.543	0.0152	35.688	6.396
47	8195	0.468	0.0161	29.161	6.768
48	8342	0.654	0.0126	51.922	6.155
49	8378	0.364	0.0177	20.610	7.281
50	8384	0.729	0.0146	49.982	5.471
51	8421	0.687	0.0122	56.173	6.037
52	8743	0.386	0.0176	21.989	7.477
53	8909	0.580	0.0147	39.556	6.224
54	9112	0.313	0.0186	16.837	7.606
55	9114	0.442	0.0165	26.833	7.214
56	9210	0.404	0.0172	23.441	7.396
57	9240	0.302	0.0187	16.165	7.716
58	9303	0.566	0.0140	40.418	6.596
59	9486	0.335	0.0186	17.984	7.721
60	9524	0.666	0.0124	53.805	6.043
61	9589	0.313	0.0195	16.078	7.857
62	9807	0.552	0.0140	39.350	6.618
63	9879	0.266	0.0205	12.946	8.086

SPBS Priority

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	82	0.813	0.0245	33.240	6.201
2	242	0.824	0.0248	33.200	6.189
3	1245	0.796	0.0266	29.967	5.999
4	2169	0.790	0.0256	30.898	6.363
5	2375	0.813	0.0260	31.252	5.870
6	2444	0.837	0.0240	34.941	6.077
7	3304	0.760	0.0303	25.088	6.762
8	3364	0.774	0.0268	28.879	6.510
9	3411	0.906	0.0265	34.257	5.774
10	3725	0.768	0.0289	26.557	6.662
11	3753	0.946	0.0198	47.655	5.154
12	4453	0.754	0.0278	27.161	6.380
13	5096	0.863	0.0303	28.508	6.167
14	5296	0.776	0.0271	28.636	6.525
15	5697	0.850	0.0226	37.589	5.907
16	5837	0.807	0.0258	31.318	5.949
17	6266	0.814	0.0255	31.941	6.274
18	6643	0.940	0.0247	38.013	5.491
19	6755	0.807	0.0243	33.213	6.168
20	7271	0.722	0.0307	23.562	6.842
21	8195	0.751	0.0280	26.833	6.395
22	8239	0.732	0.0309	23.729	6.914
23	8342	0.952	0.0198	48.062	5.202
24	8384	0.718	0.0298	24.148	6.715
25	8421	0.841	0.0308	27.327	6.334
26	9240	0.894	0.0239	37.396	5.792
27	9486	0.711	0.0302	23.527	6.778
28	9524	0.788	0.0261	30.216	6.412
29	9589	0.733	0.0299	24.491	6.724
30	9879	0.785	0.0270	29.038	6.486

Cancel/Mtr. Prep

Obs #	ID #	Est. Variability	Std. Error	T-statistic	Avg ln(TPH)
1	19	0.723	0.0081	89.807	7.566
2	26	0.680	0.0089	76.512	8.492
3	104	0.709	0.0081	87.492	7.885
4	120	0.621	0.0109	57.119	9.977
5	164	0.659	0.0098	67.020	8.924
6	341	0.691	0.0086	80.435	8.252
7	401	0.630	0.0106	59.626	9.750
8	415	0.618	0.0110	56.150	10.046
9	503	0.606	0.0115	52.767	10.299
10	507	0.740	0.0081	91.026	7.177
11	523	0.704	0.0082	85.442	7.989
12	614	0.682	0.0089	76.651	8.459

13	621	0.618	0.0112	54.989	9.791
14	659	0.712	0.0080	89.004	7.809
15	686	0.592	0.0121	49.139	10.594
16	754	0.687	0.0085	80.696	8.406
17	779	0.660	0.0094	70.572	9.153
18	862	0.609	0.0114	53.583	10.190
19	877	0.631	0.0105	60.124	9.772
20	916	0.636	0.0103	61.765	9.666
21	952	0.628	0.0106	59.140	9.838
22	1245	0.593	0.0120	49.254	10.584
23	1309	0.683	0.0089	77.219	8.427
24	1364	0.661	0.0096	68.870	8.895
25	1374	0.663	0.0092	71.944	9.080
26	1423	0.692	0.0083	83.399	8.408
27	1485	0.624	0.0108	57.791	9.930
28	1684	0.618	0.0111	55.704	10.078
29	1747	0.668	0.0092	72.801	8.769
30	1749	0.643	0.0100	64.259	9.512
31	1803	0.593	0.0120	49.251	10.584
32	1872	0.630	0.0105	59.878	9.789
33	1913	0.664	0.0092	72.165	9.067
34	2033	0.642	0.0101	63.540	9.526
35	2169	0.620	0.0109	56.803	9.999
36	2173	0.677	0.0087	77.600	8.799
37	2283	0.670	0.0092	72.911	8.718
38	2371	0.665	0.0092	72.529	9.050
39	2375	0.649	0.0098	66.347	9.262
40	2386	0.705	0.0082	85.931	7.964
41	2390	0.716	0.0079	90.491	7.735
42	2444	0.609	0.0114	53.592	10.235
43	2467	0.700	0.0083	83.915	8.068
44	2501	0.690	0.0087	79.783	8.287
45	2587	0.650	0.0098	66.616	9.372
46	2594	0.672	0.0092	73.289	8.674
47	2687	0.632	0.0104	60.605	9.741
48	2696	0.760	0.0062	121.705	6.838
49	2814	0.716	0.0079	90.611	7.729
50	2823	0.634	0.0104	61.010	9.715
51	3033	0.688	0.0087	79.120	8.323
52	3084	0.705	0.0082	85.950	7.963
53	3246	0.691	0.0085	81.128	8.270
54	3304	0.588	0.0122	48.108	10.683
55	3329	0.747	0.0072	104.092	7.075
56	3346	0.656	0.0095	69.057	9.235
57	3358	0.643	0.0100	64.356	9.506
58	3359	0.642	0.0102	62.786	9.311
59	3361	0.674	0.0091	73.836	8.619
60	3364	0.592	0.0121	49.011	10.605
61	3394	0.652	0.0097	67.514	9.321
62	3411	0.634	0.0105	60.637	9.737
63	3437	0.648	0.0100	64.682	9.184
64	3495	0.749	0.0071	105.170	7.023
65	3593	0.696	0.0086	81.131	8.154
66	3606	0.681	0.0085	79.794	8.696
67	3702	0.644	0.0100	64.706	9.485
68	3709	0.660	0.0096	68.916	8.913
69	3725	0.598	0.0118	50.615	10.471
70	3753	0.626	0.0107	58.605	9.874
71	3908	0.639	0.0102	62.886	9.596
72	3921	0.678	0.0088	76.938	8.724
73	3923	0.733	0.0075	98.038	7.367
74	3940	0.712	0.0081	88.068	7.820
75	3972	0.655	0.0098	67.237	9.018
76	4166	0.695	0.0085	81.419	8.169
77	4183	0.667	0.0094	70.937	8.767
78	4255	0.692	0.0086	80.475	8.249
79	4256	0.724	0.0080	90.094	7.550
80	4270	0.615	0.0111	55.373	10.102
81	4278	0.751	0.0066	113.868	7.166
82	4347	0.693	0.0086	81.083	8.217

83	4439	0.627	0.0107	58.731	9.865
84	4453	0.633	0.0104	60.884	9.723
85	4483	0.758	0.0070	108.786	6.845
86	4537	0.664	0.0095	70.029	8.845
87	4538	0.676	0.0096	70.302	8.539
88	4542	0.656	0.0095	68.857	9.246
89	4653	0.683	0.0090	76.077	8.785
90	4756	0.626	0.0107	58.596	9.875
91	4818	0.675	0.0095	70.787	8.567
92	4834	0.735	0.0074	99.084	7.317
93	4873	0.696	0.0084	83.165	8.166
94	4920	0.688	0.0087	79.001	8.329
95	4945	0.667	0.0091	73.246	9.013
96	4970	0.668	0.0093	72.214	9.053
97	5057	0.628	0.0106	59.299	9.827
98	5066	0.682	0.0089	76.871	8.446
99	5087	0.616	0.0111	55.510	10.092
100	5096	0.619	0.0110	56.479	10.022
101	5182	0.637	0.0103	61.974	9.653
102	5204	0.632	0.0104	60.533	9.746
103	5279	0.713	0.0076	93.669	8.071
104	5284	0.647	0.0099	65.573	9.433
105	5296	0.610	0.0113	53.777	10.221
106	5341	0.709	0.0079	89.549	7.868
107	5413	0.699	0.0081	86.451	8.265
108	5417	0.741	0.0072	102.591	7.198
109	5438	0.700	0.0083	83.962	8.065
110	5507	0.650	0.0098	66.372	9.311
111	5566	0.695	0.0085	81.404	8.170
112	5590	0.645	0.0099	64.907	9.473
113	5604	0.697	0.0084	82.838	8.124
114	5683	0.707	0.0081	86.905	7.914
115	5697	0.616	0.0111	55.646	10.082
116	5708	0.635	0.0103	61.500	9.683
117	5757	0.706	0.0081	86.919	7.947
118	5837	0.624	0.0108	58.008	9.915
119	5865	0.636	0.0103	61.914	9.657
120	5909	0.654	0.0096	68.065	9.290
121	5921	0.678	0.0087	78.152	8.772
122	5997	0.608	0.0114	53.244	10.262
123	6048	0.731	0.0075	96.939	7.420
124	6063	0.739	0.0074	99.619	7.242
125	6078	0.628	0.0106	59.150	9.780
126	6083	0.709	0.0081	87.709	7.874
127	6088	0.680	0.0090	76.020	8.494
128	6098	0.705	0.0079	89.364	8.135
129	6104	0.622	0.0108	57.466	9.953
130	6218	0.697	0.0084	82.653	8.134
131	6266	0.623	0.0108	57.766	9.932
132	6306	0.657	0.0097	67.602	8.995
133	6332	0.615	0.0111	55.417	10.051
134	6343	0.702	0.0083	84.847	8.020
135	6499	0.714	0.0076	93.946	7.942
136	6543	0.709	0.0081	87.614	7.879
137	6549	0.599	0.0118	50.770	10.458
138	6550	0.735	0.0074	98.725	7.334
139	6556	0.716	0.0079	90.510	7.734
140	6557	0.660	0.0094	70.620	8.949
141	6571	0.661	0.0093	70.858	9.137
142	6594	0.657	0.0095	69.556	9.208
143	6635	0.710	0.0081	87.949	7.862
144	6643	0.628	0.0106	59.482	9.741
145	6655	0.696	0.0085	82.335	8.151
146	6664	0.646	0.0099	65.400	9.443
147	6676	0.680	0.0090	75.936	8.499
148	6737	0.709	0.0081	87.556	7.882
149	6744	0.660	0.0094	70.438	9.160
150	6745	0.646	0.0099	65.148	9.458
151	6755	0.571	0.0128	44.569	10.966
152	6761	0.669	0.0093	72.175	8.738

153	6792	0.682	0.0088	77.613	8.456
154	6838	0.639	0.0102	62.640	9.611
155	6989	0.650	0.0098	66.639	9.371
156	6994	0.661	0.0096	69.128	8.900
157	7044	0.706	0.0082	85.805	7.947
158	7049	0.722	0.0078	93.165	7.603
159	7051	0.705	0.0081	87.040	7.973
160	7073	0.624	0.0108	57.863	9.925
161	7093	0.712	0.0080	89.021	7.808
162	7100	0.697	0.0085	82.234	8.125
163	7123	0.656	0.0096	68.662	9.162
164	7126	0.674	0.0092	73.566	8.634
165	7271	0.639	0.0103	61.907	9.653
166	7314	0.620	0.0109	56.849	9.944
167	7346	0.663	0.0093	71.671	9.094
168	7418	0.619	0.0110	56.558	10.017
169	7422	0.638	0.0102	62.290	9.633
170	7444	0.638	0.0102	62.435	9.624
171	7450	0.660	0.0094	70.638	9.149
172	7463	0.670	0.0091	73.605	8.920
173	7480	0.735	0.0074	98.842	7.328
174	7512	0.726	0.0076	95.607	7.526
175	7564	0.662	0.0095	69.630	8.869
176	7583	0.671	0.0092	73.299	8.695
177	7603	0.731	0.0073	99.907	7.417
178	7606	0.688	0.0089	77.161	8.686
179	7637	0.697	0.0084	82.579	8.138
180	7655	0.600	0.0117	51.215	10.422
181	7689	0.629	0.0106	59.506	9.755
182	7791	0.656	0.0095	69.052	9.235
183	7800	0.644	0.0100	64.422	9.502
184	7865	0.694	0.0086	80.876	8.199
185	7897	0.640	0.0101	63.103	9.582
186	7914	0.674	0.0091	74.552	8.625
187	7975	0.697	0.0088	79.720	8.108
188	8004	0.748	0.0071	104.843	7.039
189	8112	0.682	0.0089	76.778	8.452
190	8115	0.679	0.0090	75.719	8.511
191	8145	0.734	0.0075	98.381	7.350
192	8153	0.732	0.0075	97.679	7.384
193	8169	0.686	0.0091	75.156	8.346
194	8195	0.615	0.0111	55.318	10.106
195	8208	0.712	0.0081	88.169	7.815
196	8228	0.734	0.0070	104.670	7.498
197	8239	0.601	0.0117	51.289	10.416
198	8265	0.665	0.0092	72.732	9.039
199	8289	0.590	0.0122	48.503	10.649
200	8315	0.669	0.0093	72.343	8.729
201	8329	0.684	0.0088	77.413	8.416
202	8333	0.610	0.0113	53.840	10.216
203	8334	0.716	0.0079	90.460	7.736
204	8342	0.638	0.0102	62.388	9.627
205	8378	0.616	0.0110	56.111	9.911
206	8421	0.632	0.0105	60.304	9.698
207	8505	0.682	0.0089	76.427	8.775
208	8535	0.673	0.0092	72.968	8.976
209	8554	0.701	0.0083	84.134	8.057
210	8592	0.710	0.0077	91.899	8.029
211	8692	0.697	0.0084	82.538	8.140
212	8722	0.696	0.0084	83.267	8.161
213	8743	0.606	0.0115	52.601	10.312
214	8806	0.657	0.0095	69.303	9.221
215	8909	0.662	0.0093	71.239	9.117
216	8938	0.700	0.0079	88.897	8.306
217	8941	0.688	0.0087	79.064	8.326
218	8942	0.727	0.0080	91.505	7.472
219	8964	0.641	0.0101	63.644	9.549
220	8965	0.695	0.0085	81.773	8.180
221	9056	0.659	0.0096	68.441	8.943
222	9090	0.689	0.0087	79.513	8.301

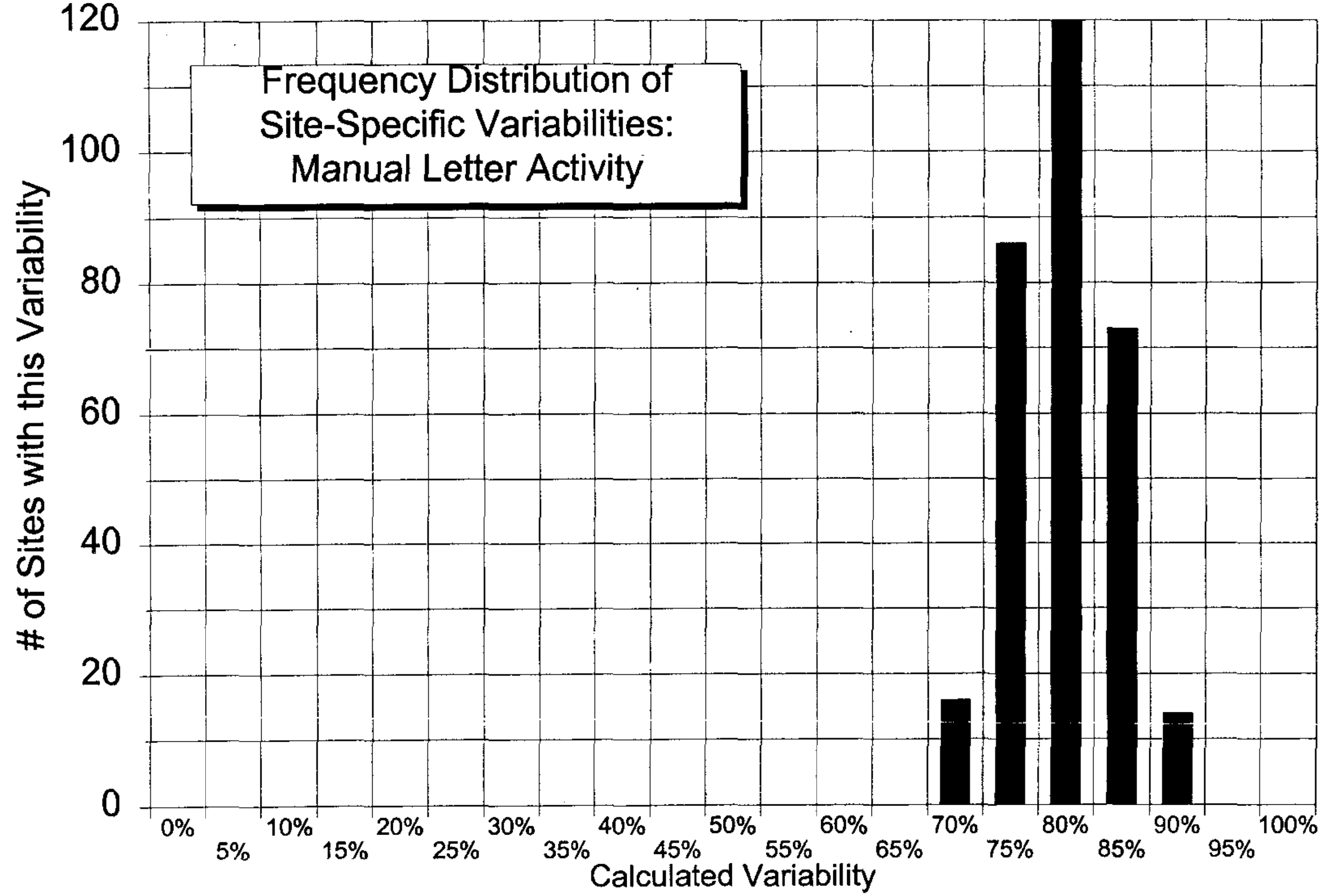
223	9098	0.690	0.0086	80.017	8.274
224	9110	0.690	0.0082	83.770	8.520
225	9112	0.636	0.0105	60.905	9.425
226	9114	0.593	0.0120	49.316	10.579
227	9210	0.615	0.0112	55.126	10.120
228	9221	0.685	0.0088	77.907	8.389
229	9240	0.602	0.0117	51.585	10.392
230	9242	0.685	0.0089	77.330	8.394
231	9263	0.673	0.0092	73.205	8.655
232	9270	0.676	0.0091	74.327	8.590
233	9303	0.636	0.0103	61.722	9.669
234	9322	0.652	0.0099	66.126	9.090
235	9486	0.596	0.0119	50.121	10.511
236	9522	0.684	0.0088	77.685	8.401
237	9524	0.605	0.0115	52.420	10.326
238	9562	0.723	0.0083	87.623	7.553
239	9589	0.595	0.0119	49.897	10.530
240	9605	0.707	0.0081	86.930	7.913
241	9607	0.723	0.0077	93.503	7.587
242	9696	0.654	0.0097	67.200	9.059
243	9698	0.720	0.0077	92.993	7.650
244	9749	0.733	0.0075	98.039	7.367
245	9775	0.772	0.0072	107.887	6.522
246	9779	0.656	0.0095	69.124	9.231
247	9792	0.695	0.0091	76.805	8.140
248	9807	0.608	0.0114	53.360	10.253
249	9865	0.704	0.0083	85.319	7.995
250	9879	0.628	0.0106	59.244	9.831
251	9882	0.715	0.0080	89.301	7.757
252	9917	0.706	0.0087	81.140	7.904
253	9961	0.656	0.0097	67.419	9.007

Attachment 3 to Response to POIR 7-1

DISTRIBUTION OF THE CALCULATED SITE SPECIFIC VARIABILITIES

ACTIVITY	USPS-T14 TABLE 7	MEAN OF THE SITE SPECIFICS	STD. DEVIATION	LOWER BOUND	UPPER BOUND
MANUAL LETTERS	79.7%	77.2%	4.6%	67.7%	89.8%
MANUAL FLATS	86.6%	85.9%	5.1%	76.3%	98.1%
OCR	78.6%	75.9%	1.7%	71.2%	80.6%
BCS	94.5%	92.3%	2.6%	84.1%	96.8%
LSM	90.5%	91.6%	0.6%	90.6%	93.7%
FSM	91.8%	87.1%	3.4%	77.7%	94.4%
SPBS PRIORITY	80.2%	80.9%	6.7%	71.1%	95.2%
SPBS NON PRIOITY	46.9%	48.5%	10.6%	21.8%	72.9%
MANUAL PRIORITY	44.8%	59.8%	24.8%	1.6%	115.8%
MANUAL PARCELS	39.5%	52.4%	20.4%	-15.4%	100.1%
CANCEL/MTR. PREP	65.4%	66.8%	4.1%	57.1%	77.2%

Attachment 4 to Response to POIR 7-1



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2. In response to POIR No. 4, question 3, pages 9 and 10, witness Bradley assumes that the fixed effects α_i variables in his mail processing models reflect non-volume factors. Witness Bradley also asserts that it is unimportant that α_i may be correlated with volume.

a. Please list the estimated fixed effects (α_i) implied by the fixed-effect models for the cost listed in Table 7 of USPS-T-14.

b. To help evaluate the assumption that the α_i variables reflect only non-volume effects, for the cost pools in "a.," please perform a linear regression of α_i on a constant term and the mean over time of $\ln(TPH_{it})$ for facility i.

c. If the coefficient of the mean over time of $\ln(TPH_{it})$ in the regression in "b" is positive please discuss why it is reasonable to assume that the α_i reflects only non-volume factors.

2. Response:

There are a couple of misconceptions in the preamble to these interrogatories that should be cleared up. First, although this may not be immediately obvious, one does not actually <u>assume</u> that the fixed effects are non-volume effects. Rather, this characteristic is guaranteed because it is a mathematical result generated by the structure of the fixed effects regression. Second, I have never suggested that it is unimportant that the site-specific effects may be correlated with volume. Just the opposite. It is quite important that these effects are correlated with volume. In fact, I present statistical evidence in my testimony that <u>demonstrates</u> that the correlation exists. Please see Table 5 on page 46 of my testimony which is entitled "Tests for The Correlation of Site-Specific Effects and

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Right-Hand-Side Variables." Moreover, as I explain in my response to POIR #4, this correlation is a reason that estimated coefficients from the pooled model are biased upward. It is also important not to forget that correlation does not imply causation. For example, age and the level of education are correlated in young men, but education does not cause age. Similarly here, the fact that the fixed effects and volume are correlated does not imply that volume causes the fixed effects.

a. Estimating an accurate fixed effects model for variabilities does not require estimation of the 2,369 site-specific coefficients referred to in the question and thus I have not estimated them. Moreover, because the instant request is based upon a misunderstanding of the issue, there is no need to estimate the 2,369 α_i now. As I have already provided evidence that the site-specific effects are correlated with volume, there is no need to estimate those additional 2,369 coefficients now to again demonstrate the same point.

b. Because I have already established that the site specific effects are correlated with volume it is unnecessary to run this auxiliary regression. Moreover, the existence of a positive, statistically significantly coefficient in the proposed auxiliary regression in no way would indicate that the α_i variables would include volume-effects. In fact, this type of auxiliary regression is used to explain why the α_i could <u>not</u> contain

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volume effects. Recall that regression coefficients in a multiple regression are actually partial regression coefficients and thus correspond to partial derviatives. That means that the coefficients are interpreted as the effect of a given right hand side variable on the dependent variable, holding the values of all other right-hand-side variables constant.

This characteristic of multiple regression coefficients can be explained and derived mathematically by use of an auxiliary regression of the type posed in the question. This is clearly explained in a well known econometrics book:

> Consider the three variable multiple regression model
>
> $$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i \qquad \text{(A4.3)}$$
>
> Our task here is to discuss in some detail how one might interpret the partial regression coefficient, say β_2, in Eq. (A4.3). We argued in the text that β_2 measures the effect of X_2 on Y, with the effect of X_3 controlled or held constant. In theory, it *makes sense to hold X_3 constant while increasing X_2, but how* is this concept actually applied when we obtain least-squares estimates for β_2 (as well as β_3)? <u>The answer lies in the realization that the estimated coefficient in the three-variable regression can be calculated by performing two two-variable regressions.</u> (This result generalizes to any multiple regression model.) The first regression adjusts the variable X_2 to"hold X_3 constant," while the second regression estimates the effect of this adjusted variable on Y. The procedure occurs in the following steps.

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Step 1 Regress X_2 on X_3. When the equation has been estimated, we can calculate the fitted values and residual of the model. To simplify we will work with the data in deviations form, so that the model is

$$x_{2i} = \hat{\alpha} x_{3i} + \hat{\rho}_i \qquad \textit{and} \qquad x_{2i} = \hat{x}_{2i} + \hat{\rho}_i$$

$$\textit{where} \quad x_{2i} = \hat{\alpha} x_{3i} \qquad \hat{\rho}_i = x_{2i} - \hat{\alpha} x_{3i} = x_{2i} - \hat{x}_{2i}$$

$$\textit{and} \qquad \hat{\alpha} = \frac{\Sigma x_{2i} x_{3i}}{\Sigma X_{3i}^2}$$

Our interest lies in $\hat{\rho}_i$, the residuals, since $\hat{\rho}_i$ represents the portion of X_2 which is uncorrelated with X_3. (Recall that the regression residuals are uncorrelated with the right-hand variable. In fact, holding X_3 constant means eliminating from X_2 that component that is correlated with X_3.

Step 2 Regress Y on $\hat{\rho}$. If we work with the data in deviations form, the model is

$$y_i = \gamma \hat{\rho}_i + v_i$$

When it is estimated, we find that

$$\hat{\gamma} = \frac{\Sigma y_i \hat{\rho}_i}{\Sigma \hat{\rho}_i^2}$$

$\hat{\gamma}$ represents the effect of "adjusted X_2" on Y and according to our argument should measure the effect of X_2 on Y holding X_3

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> constant. If we are correct, it must be true that $\hat{\gamma} = \hat{\beta}_2$.To see this we need only perform a few algebraic calculations. (Emphasis added)[7].

This mathematical exercise shows that in multiple regression, the individual coefficients are estimated by controlling for the effect of other included variables on the the dependent variable. Thus, because the variability equations include volume (in the form of TPH) it is by mathematical construction that the α_i capture only non-volume effects. Indeed, it is **impossible** for them to capture volume effects in this specification.

The mathematical exercise is precise but a bit technical. An intuitive understanding of this point can be gained by considering the following example.[8] Suppose one is estimating an econometric regression for incomes of young men and trying to measure the effect of education on income. One could start with a regression of income on education and would expect to find a positive coefficient because higher levels of income are associated with higher levels of education. However, the coefficient on education would be biased because it ignores the non-education

---

[7] See, Robert Pindyck and Daniel Rubinfeld, Econometric Models and Economic Forecasts, McGraw Hill, New York, 1981 at 97.

[8] This example is taken from William Greene, Econometric Analysis, Macmillan, 1993 at 170.

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effect coming from the fact that men earn higher income when they are older, irrespective of their education. Given that age and education are correlated, omitting age from the equation will cause education's coefficient to be biased upward as it is also capturing the age effect. Once one adds age to the regression, however, the bias disappears, the education coefficient captures just the education effect, and the age coefficient captures the "non-education" effect. Please note that despite the fact that they are correlated, education in no way causes age, and age cannot contain "education effects." It is this intuition which helps us understand why omitting the site-specific effects causes a biased regression coefficient for volume variability and why the site-specific effects do not contain any "volume effects" in the regressions in USPS-T-14.

In sum there is no inconsistency between agreeing that the site-specific effects are correlated with volume and recognizing that the site-specific effects in the regressions, the α_i, contain no volume effects.

c. It is reasonable to "assume" that the α_i contain only non-volume factors because , as shown above, they simply do not contain volume factors. In a fixed effect model, the α_i can be represented as:

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$$\alpha_i = \bar{y}_{i.} - b'\bar{x}_{i.}$$

where the familiar dot subscript notation reflects site-specific values. Note that in the variability equations, the x_i include the volume terms. This equation thus proves mathematically that the α_i cannot include the effects of volume on hours as those effects are subtracted from hours before the α_i are calculated.

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3. The form of the econometric model used to estimate the mail processing variabilities in USPS-T-14, page 36, equation (2) is not a full-form trans log equation in that products involving lagged variables are not included. Please discuss the reasons for not using the full-form of the model.

3. Response:

Equation (2) is known formally in the econometrics literature as an augmented translog. It is common practice to include a vector of control variables without their (cross) products such as the seasonal dummies or lag variables in an otherwise "complete" translog. These control variables do not add any information to the identification of the cost surface, but do add to the accuracy of the estimation of the regression coefficients. They are thus used to augment the basic translog specification.

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4. In USPS-T-14, at page 40, witness Bradley states "in previous work I found that non-volume variations in facility characteristics have an important impact on productivity." The referenced paper is Michael D. Bradley and Donald Baron, "Measuring Performance in A Multi-Product Firm: An Application to the U.S. Postal Service," published in Operations Research, Vol. 41, No. 3., May-June 1993. At page 452, the paper states

> This leads to the next step in our analysis: determining *why* some plants are more efficient than others. The answer to this question is also found through regression analysis; but now the regression is attempting to *explain* operating efficiency, not measure it. Operating efficiency is therefore regressed on all variables thought to influence it. **These variables might include factors like mail volumes processed** and delivered (to measure scale economies) . . . . [Bold supplied]

On page 454, the referenced paper describes Table 1 as a list of "the primary factors that determine operating efficiencies at individual MPCs [Mail Processing Centers], based on the MPCs' vector of factors." Table 1 lists "total piece handlings" among these factors. The paper estimates that for each ten percent increase in total piece handlings, operating efficiency increases by 2.51 percent.

a. Does this estimate of the effect of increases in total pieces handled on productivity, in part, "explain why operating efficiency varies across different locations and over time?" See page 453.

b. If the answer to "a." is yes, is this conclusion consistent with witness Bradley's assumption in USPS-T-14 that the facility-specific effects on costs (represented by the variable α_i) are only non-volume effects?

c. Please discuss why, or why not, each of the "primary factors that determine operating efficiency at MPCs" listed in Table 1 should, or should not be, included as explanatory variables in the models of mail processing labor variability proposed in USPS T-14.

d. The referenced paper observes, at page 454, that:

> crude labor productivities, like total pieces per labor hour, may be misleading because they ignore important differences in the compositions of mail volumes (letters, flats, parcels) handled

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by different MPCs.

Please discuss why, or why not, facility differences in the composition of mail sorted should, or should not, be included as an explanatory variable in the models of mail processing labor variability proposed in USPS-T-14.

e. At page 452, the referenced paper lists "[d]etermine the marginal costs of the firm's outputs" as the first step in measuring performance by the operating efficiency approach. At page 453, it observes that sorting the mail is one of the two primary functions performed at an MPC for which marginal cost must be calculated.

   (1) Was a marginal cost for sorting the mail estimated to support the conclusions in the referenced paper?

   (2) If the answer to "(1)" above is yes, please provide that estimate.

f. At page 457, the referenced paper states that complete regression results are available from the authors upon request. Please provide them.

4. Response:

a. For many mail processing activities, the piece-handling variabilities are less than one. This means that, holding all other factors constant, as volume changes in a mail processing activity, productivity will also change. Thus, if volume is rising for a variety of activities in a facility, its operating efficiency will be influenced. Presumably volume rises and falls through time, so changes in volume would be a factor which causes operating efficiency to change through time.

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b. Absolutely. As I demonstrated in my answer to question 3 above, the α_i do not contain volume effects. In similar fashion, the other control variables discussed in this paper capture the non-volume effects. That is why the results discussed in the published paper represent the verification of the volume variabilities that the Presiding Officer was requesting. Tr. 11/5577. The published paper contains a pooled model, but that pooled model contains the proper variables to control for the site-specific effects in contrast to the naive and thus biased pooled model presented at Tr. 11/5579 as a cross examination exhibit. When non-volume, site-specific effects are important, they must be accounted for in the regression equation. One approach, which I took in my earlier, published paper, was to estimate a pooled model with variables included to account for non-volume site specific effects. This was appropriate because I was estimating a facility-wide equation for total cost.

In USPS-T-14, I am estimate activity level equations, not facility level equations for labor cost. Therefore, the appropriate way to account for site-specific effects is the alternative approach, through the use of the fixed effects model, or heuristically, the inclusion of the site-specific effects (α_i). It is well known that omission of these dummy variables will lead to biased coefficient estimates. For example, I am attaching a graph from a well known econometric text book that demonstrates why

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it is wrong to simply plot the data and draw a straight line through it.[9] If it does not account for the dummy variables, that straight line will be biased and erroneous. The graph contains a plot of points which would appear to have a steeply sloped regression line running through them, a regression line that runs through the origin. However, that regression line ignores the fact that the points in the plot are really generated by a much flatter regression line, one that shifts with variations in the values for the dummy variables. Failure to recognize the heterogeneity in the data generating process would cause one to mistakenly overstate the slope of the regression line. This is why the econometrics literature contains strong prohibitions against using simple pooled models in the face of unit-specific effects:[10]

> Obviously, in these cases, pooled regression ignoring heterogenous intercepts should never be used. (Emphasis added)

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9 See, G.S. Maddala, Econometrics, McGraw-Hill, New York, 1977, at 139.

10 See, Cheng Hsiao, Analysis of Panel Data, Cambridge University Press, Cambridge, 1986 at 6.

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c. Table 1 below contains the factors from Table I of the published article and their disposition in USPS-T-14. Recall that there are four main differences between the analyses. First, the Operations Research article included analysis done at the facility level but USPS-T-14 includes analysis done at the level of the mail processing activity. Second, the Operations Research article included both mail processing costs and delivery costs but USPS-T-14 focuses solely on mail processing costs. Third, the Operations Research article features a pooled equation with appropriate control variables whereas USPS-T-14 features panel data with a fixed effects model. Because the fixed effects in the panel data model serve the same purpose -- controlling for site-specific non-volume effects -- as the control variables in the pooled model, it is not necessary to include control variables in the fixed effects model. Fourth, the Operations Research analysis investigates total costs; USPS-T-14 investigates only labor cost.

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Table 1	
Factor	Disposition in USPS-T-14
Degree of automation	Included in USPS-T-14 through the MANR terms.
Volume of mail	Included in USPS-T-14 through the TPH terms.
Age of facility	Included in USPS-T-14 through the fixed effects and time effects. (All facilities age at the rate of 1 year per year.)
Degree of support costs	Not relevant for USPS-T-14 because it focuses on costs at the activity level.
Space utilization	Not relevant for USPS-T-14 because it focuses only on labor costs.
Degree of flex labor	To the extent this varies across facilities, it would be included in USPS-T-14 in the fixed effects. To the extent is rises or falls through time it would be included in USPS-T-14 in the time trends.
Delivery network	Not relevant for USPS-T-14 because it does not include delivery costs.
Number of locations	Included in USPS-T-14 in the fixed effects.

The factors that are important for an activity level analysis of variability are included in USPS-T-14. These include volume (as measure by TPH), the effect of automation (as measured by MANR), the site specific effects and the time trends.

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d. Differences in the composition of mail (letters, flats, parcels) should not be included as explanatory variables in USPS-T-14 because the equations are at the activity level not the facility level. In my Operations Research article, the analysis was at the facility level, so a different mix of letters, flats and parcels could imply a different workload for the same number of TPH. In USPS-T-14, the manual letter activity contains only letters, the manual flat activity contains only flats and the manual parcel activity contains only parcels. Variations in the mix of mail are captured directly by virtue of the fact that separate equations are estimated for individual shape/technology mail processing activities. That is, not only are separate equations estimated for letters, flats, and parcels, but separate equations are also estimated different sorting technologies (e.g., manual letter processing, mechanized letter processing, and automated letter processing).

e.(1) Yes.

e.(2) The regressions for this article were run some six years ago. Unfortunately, neither of the coauthors can locate them. Thus, the marginal cost estimates are not available.

f. The regressions for this article were run some six years ago. Unfortunately, neither of the coauthors can locate them. Thus, the results are no longer available.

Attachment 1 to Response to POIR 7-4
page 1 of 1

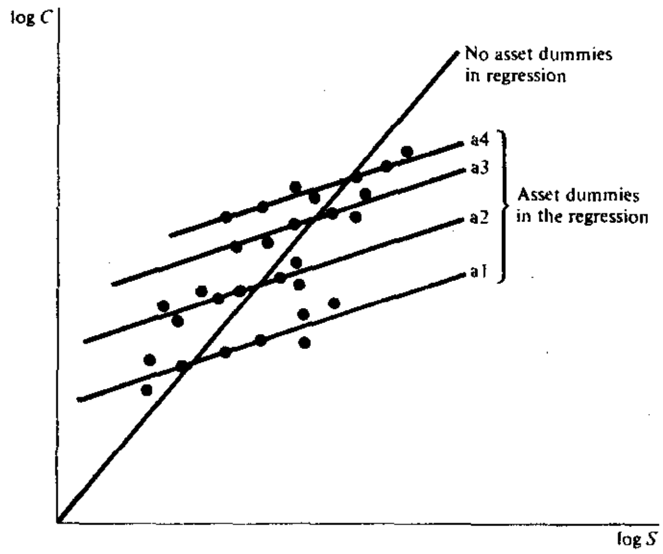

Figure 9-2 Bias due to omission of dummy variables.

and dummy variables. Some further examples of analysis from grouped data will be given later.

As mentioned earlier, dummy variables are not necessarily (0,1) variables. As an illustration, consider the joint estimation of the demand for beef, pork, and chicken on the basis of data presented in Table 7-5. Waugh estimates a set of demand functions of the form

$$\begin{aligned} P_1 &= \alpha_1 + \beta_{11}x_1 + \beta_{12}x_2 + \beta_{13}x_3 + \gamma_1 y + u_1 \\ P_2 &= \alpha_2 + \beta_{12}x_1 + \beta_{22}x_2 + \beta_{23}x_3 + \gamma_2 y + u_2 \\ P_3 &= \alpha_3 + \beta_{13}x_1 + \beta_{23}x_2 + \beta_{33}x_3 + \gamma_3 y + u_3 \end{aligned} \tag{9-6}$$

where P_1 = retail price of beef
P_2 = retail price of pork
P_3 = retail price of chicken
x_1 = consumption of beef per capita
x_2 = consumption of pork per capita
x_3 = consumption of chicken per capita
y = disposable income per capita

x_1, x_2, x_3 can be obtained from Table 7-5. The prices in Table 7-5 are, however, retail divided by a consumer price index. Hence we multiplied them by the consumer price index p to get p_1, p_2, and p_3. This index p and disposable income y are as follows:[1]

[1] There appears to be a misprint in the price of beef given in Table 7-5 for the year 1950 (on the basis of other information given in Waugh). We corrected this to 83.3 from 88.3.

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5. In USPS-T-14, at pages 80-84, witness Bradley performs an analysis to demonstrate the likely impact of measurement error in TPH on the estimated variabilities, using a first-difference estimator of equation (2) on page 36. He computes the first-difference estimator only. Differences in equation (2) estimated for longer lengths would also be useful in determining the likely impact of measurement error. For example, differencing equation (2) with its value lagged 13 accounting periods would help confirm the impact of measurement error and eliminate the accounting period dummy variables in the differenced model.

a. Please compute the ordinary least squares estimate of the 13^{th} difference version of equation (2), including all regressors that are not eliminated by the differencing process, for the cost pools listed in Table 7. As described on page 36, lines 10 through 12, please mean center the data before differencing.

b. Please compare the variability estimates obtained in "a." with those obtained from the first-difference and fixed-effect model estimates given in Table 7 of USPS-T-14.

c. Please comment on the degree to which the estimates from "a." confirm those reported in Table 7 and discuss the extent to which divergence between the two sets of estimates can be explained by the presence of measurement errors in TPH.

5. Response:

a. The requested results are presented in Attachment 1 to this response.

b. The variability estimates for the 13^{th} differences, like the results for 1^{st} differences, are similar to but a bit lower than the fixed effects presented in Table 7.

c. The results certainly confirm the result that the variability for the mail processing activities is less than one. I don't think the differences between the two results can

Response of United States Postal Service Witness Bradley
to
Presiding Officer's Information Request #7

be explained by measurement error for TPH for two reasons. First, the errors-in-variables analysis presented in my testimony showed that measurement error did not have a big effect in the manual letter and flat activities. Second, measurement error is not an issue for the mechanized and automated activities because the TPH for these activities come directly from machine counts. Nevertheless, the 13^{th} difference variabilities are lower to the same extent for these activities as they are for those activities for which measurement error might be an issue.

Attachment 1 to Response to POIR 7-5

Econometric Results from Estimating the Model on 13th Difference Data

	Manual Letters	Manual Flats	LSM	FSM	OCR	BCS	SPBS Non Priority	SPBS Priority	Manual Parcels	Manual Priority	Cancel & Mtr. Prep
Piece Handlings	0.5226	0.5263	0.8873	0.8266	0.7585	0.8419	0.6505	0.8772	0.3715	0.3469	0.3449
Manual Ratio	-0.1136	0.0245	-0.0347	-0.0220	-0.0056	0.0038	N.A.	N.A.	N.A.	N.A.	N.A.
Time Trend 1	-0.0017	0.0007	-0.0008	0.0005	-0.0030	-0.0021	-0.0017	-0.0107	0.0010	-0.0001	0.0019
Time Trend 2	0.0031	0.0001	0.0006	-0.0003	-0.0044	-0.0027	0.0047	0.0140	-0.0003	0.0005	-0.0024
R2	0.477	0.589	0.929	0.663	0.500	0.621	0.513	0.642	0.248	0.282	0.245
# of Obs.	20,764	20,089	16,627	15,096	15,455	19,006	3,840	1,577	14,303	13,123	16,268
# of Sites	309	300	239	219	234	287	63	30	234	201	253

DECLARATION

I, Michael D. Bradley, declare under penalty of perjury that the foregoing answers are true and correct, to the best of my knowledge, information, and belief.

Dated: Dec. 9th, 1997

RESPONSE OF POSTAL SERVICE WITNESS TOLLEY
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

6. Please provide the formula used to calculate the following TYBR discounts:

Mail Category	Before-Rates Discount
Standard A Nonprofit	
Presort Nonletters	4.478295
Automation Basic Flats	2.107374
Automation 3/5-Digit Flats	6.919693

These discounts appear in USPS-T-7, "Direct Testimony of Thomas E. Thress," Table IV-1, page 221, and LR-H-295, "Diskette Relating to Revisions of Dr. Tolley, USPS-T-6," Spreadsheets SF_R97.WK4 and SF_R97AR.WK4, page PAF Params, Cells AW30, AY30, and BB30.

RESPONSE:

These discounts are calculated in the file, D3N_NL.WK4, which is contained in Library Reference LR-H-312, and is being filed with this response.

RESPONSE OF POSTAL SERVICE WITNESS TOLLEY
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

7. Refer to LR-H-172, "Derivation of After-Rates Fixed Weight Price Indices," Spreadsheet STASP96A.WK4, "Standard A Single Piece." Please confirm that the following changes should be made in FY 1996 Billing Determinants and fixed weight price indices (FWIs) for Standard A Single Piece mail:

a. Cells SGL_PC:C16 and UNIFIED:C8, figure 0.343 should be changed to 0.686.

b. Cells BULK:B17 and BULK:C17, figure 2.828 should be changed to 2.282.

c. Cells BULK:C29 and UNIFIED:C9, figure 145.667 should be changed to 145.121.

d. Cell UNIFIED:C11, figure 146.010 should be changed to 145.807.

e. Cell UNIFIED:E2, figure 1.022448 should be changed to 0.978045 (1/1.022448).

f. Cells UNIFIED:E172 through UNIFIED:E181, figure 0.976318 should be changed to 0.928992.

g. Cells UNIFIED:E183 through UNIFIED:E193, figure 1.024883 should be changed to 0.975477.

RESPONSE:

(a) - (g). Confirmed.

RESPONSE OF POSTAL SERVICE WITNESS TOLLEY
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

8. Refer to LR-H-295, "Diskette Relating to Revisions of Dr. Tolley, USPS-T-6," Spreadsheet SF_R97AR.WK4. Please provide the source of the before-rates Standard A single piece FWI entry of "$0.974030" in cell FWIs:AC8.

RESPONSE:

This figure is obtained from the file 3S96.WK4, in cells UNIFIED:E119 - E193. This file differs from the before-rates fixed-weight index spreadsheet as filed in LR-H-171 in that single-piece keys and IDs weighing two ounces or less are combined (as has been done historically) into a single row, rather than being separated into keys and IDs weighing less than one ounce and those weighing between one and two ounces, as is necessary in order to calculate the after-rates fixed-weight price index for Standard A single-piece mail. If the errors identified in questions 7.b & 7.e. of this P.O.I.R. are also corrected in the file 3S96.WK4, the before-rates fixed-weight index for Standard single-piece mail, as calculated in this file, will be equal to $0.928992, as identified in question 7.f. of this P.O.I.R. In other words, the before-rates fixed-weight price index for Standard A single-piece mail calculated in the file 3S96.WK4 (if corrected) is exactly equal to the before-rates fixed-weight price index for Standard A single-piece mail as calculated in the file STASP96A.WK4 in LR-H-172 (if corrected).

The spreadsheet 3S96.WK4 is contained in Library Reference LR-H-312, filed with this response. In order to show the source of the $0.974030 figure cited in this question, the errors identified in question 7 of this P.O.I.R. have not been corrected in this spreadsheet. As noted above, correcting these errors would result in the file 3S96.WK4 yielding the same before-rates fixed-weight price index as the file STASP96A.WK4 filed in LR-H-172.

DECLARATION

I, George Tolley, declare under penalty of perjury that the foregoing answers are true and correct to the best of my knowledge, information and belief.

(Signed)

12-8-97

(Date)

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

9. Please provide the detailed calculations and sources used to derive the figure shown at LR H-106, page VI-8, column 6, for the line entitled "1st Pr. -NCarr-Rt & Car. Rt. The amount shown is 1,999,683. Please also confirm that this is in thousands of dollars.

Response:

I confirm that 1,999,683 is in thousands of dollars. This is the total test year mail processing costs for First-Class presort letters, flats and parcels (presort and carrier route presort) computed using the unit costs from pages II-5, III-5, and IV-5 prior to the application of the reconciliation factor (which is contained in column 7 of page VI-8). This calculation is shown in Table 1 below. This amount differs from the test year before rates mail processing costs based on witness Patelunas testimony, USPS-T-15, which is $1,982,973 (in thousands) as shown in column 5 of page VI-8. This difference is reconciled by the application of the reconciliation factor which is 1,982,973/1,999,683 = .99164 as shown in column 7 of page VI-8 for this category. All the results contained on pages II-5, III-5, and IV-5 for the columns for "1st Pr. Carr-Rt" and "1st Pr. NCarr-Rt" have been multiplied by the factor .99164, consequently the mail processing costs for all shapes for these two columns sum to the test year costs of $1,982,973 (in thousands) as shown in Table 2 below.

The calculation of $1,999,683 is based on the unit costs on pages II-5, III-5, and IV-5 *prior to the application of the factor .99164. The unit costs prior to the application* of the reconciliation factor are obtained from the spreadsheet "CSTSHAPE.XLS" by going to the spreadsheet page "PremPay" and setting the cell E25 to 1. Multiplying the

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

(response to question 9 continued)

resulting unit costs times the test year before rates volumes leads to $1,999,683, *as* shown below.

Table 1: Total First-Class Presort Costs With Unreconciled Unit Costs

	Unit Costs Prior to *Reconciliation* (cents/piece)	Test Year Before Rates *Volumes* (in thousands)	*Total Costs* (in thousands)
1st Pr.NCarr-Rt.			
Letters	4.637335	39,297,407	1,822,352
Flats	20.91005	630,595	131,858
Parcels	38.212386	26,432	10,100
1st Pr.Carr-Rt.			
Letters	2.27829	1,552,574	35,372
Total			1,999,683

Table 2: Total First-Class Presort Costs With Reconciled Unit Costs

	Unit Costs After Reconciliation (cents/piece)	Test Year Before Rates Volumes (in thousands)	Total Costs (in thousands)
1st Pr.NCarr-Rt.			
Letters	4.598585	39,297,407	1,807,125
Flats	20.735323	630,595	130,756
Parcels	37.893077	26,432	10,016
1st Pr.Carr-Rt.			
Letters	2.259257	1,552,574	35,077
Total			1,982,973

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

10. LR-H-106, page VI-2, column 1, spbs Oth, shows a figure of 20,237. This amount comes from LR H-77, page 194, column 4, line 17. According to the electronic spreadsheet version, the amount is calculated as follows: 20,237 = 192,529 times [(194.5/176) -1].

a. Please provide an explanation for what the numbers, 194.5 and 176, represent.

b. Please provide the source for these numbers.

c. Please discuss the rationale for the calculation. Interestingly, the 20,237 is the only number in column 4 of page 194 that is based on column 3. All the other cost reduction amounts and other program costs come from USPS-T-15, Appendix A, page 6 for FY 1997 and page 10 for FY 1998. Please be sure to include in your discussion of the rationale an explanation for the different treatment accorded spbs Oth.

Response:

a. The figures 194.5 and 176 are the mid-year number of Small Parcel and Bundle Sorters (SPBS) for the fiscal years 1997 and 1996 respectively.

b. These figures are calculated as shown at page V-5 of LR-H-127, based on information from Engineering and Operations.

c. The rationale is to reflect the additional labor costs associated with the SPBS, given the additional deployments of SPBS. The $20.237 million is the estimated additional costs for SPBS staffing.

The difference in treatment for the "SPBS Oth" cost pool is necessary to obtain the total changes in the costs for this cost pool and the cost pools 1OPbulk and 1OPpref as discussed in response to questions 12 and 13. The savings from the SPBS deployments of $27.274 million as shown at LR-H-77 page 195 line 5 (as per witness Patelunas, USPS-T-15, Appendix A) is the <u>net</u> savings. It is the net of the

(response to question 10 continued)

increased staffing costs for SPBS and the savings in opening units (or "Sorting to Rolling Containers") which perform manual bundle and parcel sorting. If staffing costs grow for the SPBS by $20.237 million, then the savings in opening units (or "Sorting to Rolling Containers") due to the additional SPBS which is consistent with the net savings of $27.274 million is the sum of these two figures: $20.237 plus $27.274 equals $47.511 million. In this case, as well as for FSM & FSM 1000 programs (see pages 195-196 of LR-H-77), it was necessary to estimate the additional costs and corresponding savings that would be associated with the budgeted net savings provided by witness Patelunas.

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

11. The 192,529 referenced in question 10 is calculated as follows. First, calculate mail processing overhead factors for each mods group, each BMC group, and the nonmods offices. Second, for each mods, BMC, and nonmods group, multiply the FY 1996 volume variable mail processing cost for small parcel and bundle sorting (SPBS) by the overhead factors from the first step. The SPBS costs come from LR H-146, pages VII-17 to VI-19 for the column with the heading "17 SM PCL BNDL SRT." Third, sum the results from the second step yielding 176,195. Fourth, adjust the 176,195 to include the lump sum costs resulting in 176,645. Fifth, multiply the step four amount by the combined wage and volume growth factors for FY 1997 and FY 1998 producing 192,529.

According to LR H-77, page II-4, the lump sum adjustment above uses the volume variable lump sum costs from USPS-T-5, WP-B, W/S 3.1.1, page 4, column 8, line 50. In contrast, when making the same adjustment to the mail processing costs by shape earlier in LR H-106, page VI-1, line 3, which sources the same worksheet, the costs reflect the accrued level not the volume variable level. Both lump sum adjustment factors are used in LR H-106 to derive test year volume variable mail processing cost by shape. Please discuss the rationale for using different lump sum adjustment methods within this cost study.

Response:

The two lump sum adjustments calculations which are cited are virtually identical. The two lump sum factors are .0025601446 from LR-H-77, page 197 and .002559941 from LR-H-106, page VI-1. These differ by .0000002036. The ratio of lump sum payment to total salaries excluding lump sum is the same for both volume variable costs and total accrued costs since the lump sum payments are distributed proportionately to labor cost. The observed difference probably stems from rounding.

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

12. The 20,237, referenced in question 10, is also used as a cost reduction amount in LR H-77 at page 194, column 4, line 24, i.e., 20,237 is used in the calculation to derive (56,634), the amount in column 4, line 24. Please provide a rationale for this calculation.

Response:

The savings for "Sorting to Rolling Containers" of $56.634 million is the sum of the savings of $47.511 from the SPBS deployment plus $9.122 million savings due to the Tray Management System (see page 195, line 10 of LR-H-77). The calculation of the $47.511 million savings is discussed in response to question 10. As indicated in response to question 10, $20.237 million is my estimate of both the costs associated with additional staffing for SPBS and the corresponding additional SPBS program savings in the activity "Sorting to Rolling Containers" <u>in addition to</u> the net savings of $27.274 million for SPBS (see LR-H-77 at page 195, line 5).

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

13. The amount in LR H-77 at page 194, column 4, line 24, (56,634), is subsequently used to derive the cost reduction amounts shown in LR H-106, page VI-2, column 1, 1OPbulk and 1OPpref. The (56,634) is multiplied by 0.5 yielding (28,317). This amount is used both for 1OPbulk and 1OPpref. Please provide the rationale for this calculation.

Response:

"Sorting to Rolling Containers" costs are included in both the 1OPbulk and 1OPpref cost pools. I have assumed that half of the total savings of $56.634 million for "Sorting to Rolling Containers" shown in LR-H-77 at page 194, column 4, line 24 would go to each of these cost pools as shown in LR-H-106 at page VI-2, column 1.

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

14. This question concerns the escalation factor used to update base year level cost to the test year level. In Docket No. MC95-1, LR MCR-10, the Postal Service updated unit costs by shape using the ratio of TYAR Direct Mail Processing unit cost (excluding mail processing overhead) to Base Year Mail Processing unit cost. The Test Year costs reflected the CRA level. The Base Year cost reflected LIOCATT level cost divided by volume, i.e., mail processing cost without Workpaper B adjustments, without overhead, and without premium pay. (See MC95-1, LR MCR-10, Table C, page 2, L.8; Table D, page 2; Table E, page 2, and Table F, page 2.)

In Docket No. R97-1, the Postal Service uses the same type of test year/ base year ratio, but the underlying numbers reflect a different level of cost than in Docket No. MC95-1. The Base Year unit costs reflect mail processing overhead, the Workpaper B adjustments, premium pay, the savings from cost reductions in FY 1997 and FY 1998, and the cost of other programs for FY 1997 and FY 1998. The Test Year unit cost reflects CRA level mail processing costs including overhead. (See LR H-106, pages II-4, III-4, IV-4, VI-2, and VI-8.)

Please discuss the rationale for including FY 1997/FY 1998 cost reductions and other program cost in the base year cost prior to the TYAR escalation factor.

Response:

The two escalation factors which you describe differ in part because of the prior inclusion of the cost reductions and other programs adjustment ratio from LR-H-106 at page VI-2. In addition, witness Degen's development of mail processing costs doesn't rely on LIOCATT and does not have the same treatment of mail processing overhead costs as discussed in his testimony, USPS-T-12.

The costs shown at pages II-4, III-4 and IV-4 aren't base year costs, per se, but rather just an intermediate step toward getting test year costs. Applying the cost reductions and other programs adjustment ratio prior to the test year escalation as opposed to after the escalation shouldn't lead to a difference in the results due to the reconciliation to test year labor and piggybacked costs as done at page VI-8, columns 5-7.

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

(response to question 14 continued)

An important point to note in comparing the two approaches is that the overall reconciliation is the same. That is the benchmark costs or mail processing costs by shape for a given category are adjusted to have the same weighted average as the test year average mail processing costs. In Docket No. MC95-1, LR MCR-10 the reconciliation targets are computed in Table I and the reconciliation factor is computed in Table H. In LR-H-106, the reconciliation target is computed at page VI-8, column 5 in the same way as done in LR MCR-10 in Table I. The reconciliation ratio is applied in the same way on page VI-8, column 7. The form of the calculations is different but the process and the result is the same, with the benchmark costs by shape totaling to the test year mail processing cost as per witness Patelunas (both labor and piggybacked costs).

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

16. What is the purpose of the mail mix adjustment in LR H-106?

Response:

The mail mix adjustment is provided in LR-H-126. This library reference provides the changes in volume variable mail processing labor costs (component grouping 3.1) in First-Class Mail and in Standard A categories stemming from reclassification reform and other mail volume mix changes occurring between FY96 and FY97. This adjustment reflects the changes in unit costs that would stem from the changes such as the growth in prebarcoding for letters and flats which occurred between FY96 and FY97.

The shape/presort adjustment is done to reflect the mail mix adjustment (see pages VI-3 to VI-7 of LR-H-106). The shape/presort adjustment reapportions the test year costs by shape and presort level to reflect the changes occurring between the base year and test year, which are accounted for by the mail mix adjustment (see pages VI-3 to VI-7 of LR-H-106).[1]

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[1] An example of this adjustment is the reduction in costs for First-Class carrier route presort letters. The base year labor costs for this category is $30,111,000 as indicated at page II-1 of LR-H-106, while the FY 1997 projection of the cost for this category is $18,220,000 see page II-5 of LR-H-126. The decline in costs reflects the decline in volumes for First-Class carrier route presort letters due to the non-eligibility of automation carrier presort in 5-digit Zip Codes in which DPS is performed by DBCS. The factor , .595, from revised page VI-3 of LR-H-106, is multiplied times the First-Class carrier route presort letter costs in page II-4 (as part of the calculations in page II-5 to obtain test year costs) to reflect the anticipated cost change.

RESPONSE OF U.S.POSTAL SERVICE WITNESS SMITH
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

17. The mail mix costs in LR H-106 on pages VI-3 to VI-7 reference LR H-126. On *page III-3 of LR H-126, the model unit cost for a nonprofit automation basic letter is* 2.5175 cents per piece. The referenced source for this cost is LR H-126, Part VI, Section 6, page 1; but, the cost there is 0.3012 cents. Please provide the source for the 2.5175 cents. If the source does not show the derivation of this figure please provide it.

Response:

The total model cost of .3012 shown in LR-H-126, Part VI, Section VI, page 1 is incorrect. Summing the "Weighted Costs" of column 8 results in the 2.5175 cents per piece, which is relied on at page III-3. Replacement pages for LR-H-126, Part VI, Section VI, page 1 and revised spreadsheets containing this page are being filed.

DECLARATION

I, Marc A. Smith, hereby declare, under penalty of perjury, that the foregoing Docket No. R97-1 interrogatory responses are true to the best of my knowledge, information, and belief.

Marc A. Smith

Marc A. Smith

12/9/97

Date

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS MCGRANE
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

POIR No. 7, Question 15. Please provide the source (worksheet, column, line number) in LR H-106 for Exhibit 44A, Table 1, column, on pages 4, 5, 6, and 7, variable mail processing costs.

RESPONSE:

Column 6 on pages 4, 5, 6, and 7 of Exhibit USPS-44A is the product of the adjusted cost from LR H-106, the premium pay factor from LR H-106, and the piggyback factor from LR H-106. For pages 5 and 7, non-letter shape mail for commercial ECR and Nonprofit ECR, the columns are the sum of these calculations for flat and parcel mail. The following table contains the sheet and cell references used from LR-H-106. Please note that the "Adj. Letter" sheet and the "Adj. Flatcst" sheet are missing the row for the "MAILGRAM" costpool which appears in the "Adj. Parcelcst" sheet and the "Pigbkfactrs" sheet.

Page in Exhibit 44A	Source of Adjusted Costs	Source of Premium Pay Factor	Source of Piggyback Factors
Page 4, Comm. ECR Letters	Sheet "Adj. Letter", Column K	Sheet "PremPay", Cell K14	Sheet "Pigbkfctrs", Column H
Page 5, Comm. ECR Flats	Sheet "Adj. Flatcst", Column K	Sheet "PremPay", Cell K14	Sheet "Pigbkfctrs", Column H
Page 5, Comm. ECR Parcels	Sheet "Adj. Parcelcst", Column H	Sheet "PremPay", Cell K14	Sheet "Pigbkfctrs", Column H
Page 6, Nonprofit ECR Letters	Sheet "Adj. Letter", Column I	Sheet "PremPay", Cell I14	Sheet "Pigbkfctrs", Column H
Page 7, Nonprofit ECR Flats	Sheet "Adj. Flatcst", Column I	Sheet "PremPay", Cell I14	Sheet "Pigbkfctrs", Column H
Page 7, Nonprofit ECR Parcels	Sheet "Adj. Parcelcst", Column J	Sheet "PremPay", Cell I14	Sheet "Pigbkfctrs", Column H

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS MCGRANE
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 7

POIR No. 7, Question 18. Exhibit 44A, shows the separation of mail processing cost for enhanced carrier route (ECR) and nonprofit enhanced carrier route (NPECR) between walk-sequence direct tally cost and nonwalk-sequence direct tally cost. Why didn't the Postal Service further separate the walk-sequence tally cost between high density and saturation which would have provided a basis for computing mail processing cost for each rate category in ECR and NPECR?

RESPONSE:

Until the implementation of Classification Reform on July 1st of 1996, the endorsements for high density and saturation mail were the same, so the separation of costs between high density and saturation could not be made for all of FY 1996.

DECLARATION

I, Michael R. McGrane, declare under penalty of perjury that the foregoing answers are true and correct to the best of my knowledge, information, and belief.

Michael R. McGrane

December 9, 1997
Date

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS NEEDHAM
TO PRESIDING OFFICER'S INFORMATION REQUEST NO.7 QUESTION 19

POIR No. 7 Question 19. Have their been any changes in the number of post office box renewals since the implementation of MC96-3 fees? If so, please provide the data disaggregated to the finest level possible.

RESPONSE:

No data on box renewals are available.

DECLARATION

I, Susan W. Needham, declare under penalty of perjury that the foregoing answers are true and correct, to the best of my knowledge, information, and belief.

Susan W Needham

Dated: 12/9/97

20. Please refer to Exhibit USPS-33W (sic) (revised 10/06/97). The "net nontransportation cost" shown on line 8 is found by subtracting line 7 from the "total [adjusted] nontransportation costs" shown on line 3. The figure on line 7, however, appears to have the character of a revenue, since it is found by multiplying the number of postage pounds (line 6) by marked-up cost element (line 5). Accordingly, please explain the meaning and the use of the "cost" figure on line 8.

Response:

The use of the word "cost" on line 8 of Exhibit USPS-33N is unintentionally misleading. If fact, the figure represents the residual costs after subtracting the marked up and contingency adjusted total nontransportation weight related cost. The marked up and contingency adjusted nontransportation weight related cost per pound is added to the marked up and contingency adjusted transportation cost per pound to derive the pound charges by zone shown in USPS-33O, column 14 (USPS-33O, column (12)+ column (13)= column (14)). The figure in USPS-33N, line 8 is than used to develop the marked up and contingency adjusted net nontransportation cost per piece also shown on line 13. USPS-33N, line 8 cost is divided by the test year after rates volumes including new delivery confirmation volume (USPS-33N, line 21), the result, net nontransportation cost per piece is shown on USPS-33N, line 10. This figure, in turn, is adjusted for the markup and contingency factor with the result shown on USPS-33N line 13. The development of this figure is consistent with the development of the marked up and contingency adjusted nontransportation cost per pound shown on USPS-33N Line 5 and included in the pound charge in USPS-33O, column 14.

DECLARATION

I, Thomas M. Sharkey, declare under penalty of perjury that the foregoing answers are true and correct, to the best of my knowledge, information, and belief.

Thomas M. Sharkey

Thomas M. Sharkey

Dated: 12/4/97

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all participants of record in this proceeding in accordance with section 12 of the Rules of Practice.

David H. Rubin

David Rubin

475 L'Enfant Plaza West, S.W.
Washington, D.C. 20260-1137
December 9, 1997